

M115.1:1947

ANNUAL REPORT OF THE
GOVERNOR OF THE
PANAMA CANAL, 1947

386
P187
1946/47

University
of Florida
Libraries



ANNUAL REPORT
OF THE
GOVERNOR OF
THE PANAMA CANAL

FOR THE
FISCAL YEAR
ENDED JUNE 30
1947



UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1948

386

P187

1946/47

TABLE OF CONTENTS

	Page
Introduction.....	1
Operation and maintenance of the Canal.....	2
Operation of auxiliary enterprises—business operations.....	2
Government—administration.....	2
Services rendered to shipping by The Panama Canal.....	2
Net revenues.....	3
Replacements.....	3
SECTION I—CANAL OPERATION AND TRADE VIA THE PANAMA CANAL	
Statistics on Canal traffic.....	5
Ocean-going, tolls-paying traffic.....	6
Canal traffic by fiscal years, 1915 to 1947.....	9
Traffic by months—fiscal years 1947 and 1946.....	10
Nationality of vessels transiting Canal.....	10
Cargo carried by vessels of leading maritime nations.....	11
Vessels paying tolls on displacement tonnage.....	11
Classification of vessels.....	11
Laden and ballast traffic by nationality.....	14
Average tonnage, tolls, and tons of cargo per cargo-carrying vessel.....	15
Steam, motor and other vessels.....	15
Frequency of transit of vessels through the Panama Canal.....	15
Gross tonnage of vessels.....	17
Principal commodities.....	19
Origin and destination of cargo segregated by countries in principal trade areas.....	20
Cargo shipments segregated by trade routes.....	26
Total cargo shipments—Atlantic to Pacific.....	26
Total cargo shipments—Pacific to Atlantic.....	27
Important commodity shipments over principal trade routes—Atlantic to Pacific.....	28
Important commodity shipments over principal trade routes—Pacific to Atlantic.....	31
Ocean passenger traffic.....	36
Transient passengers.....	36
Small tolls-paying vessels transiting Canal.....	37
Vessels entitled to free transit.....	37
Canal operation and maintenance.....	38
Hours of operation.....	38
Lockages and lock maintenance.....	38
Operating schedule of locks.....	38
Lockages.....	39
Delays to shipping.....	40
Maintenance.....	40
Atlantic locks overhaul.....	41
Power for Canal operation.....	42
Water supply and general weather conditions.....	42
Water supply.....	42
Air temperatures.....	44
Winds and humidity.....	45
Tides.....	45
Seismology.....	45
Marine activities.....	46
Harbor activities.....	46
Aids to navigation.....	46
Accidents to shipping.....	47

SECTION I—CANAL OPERATION AND TRADE VIA THE PANAMA CANAL—Con.

Canal operation and maintenance—Continued	
Marine activities—Continued	Page
Inspections.....	47
Admeasurement.....	47
Salvage and towing.....	47
Operation of tugs.....	48
Maintenance of channel—other dredging activities.....	48
Ordinary channel maintenance—Canal prism dredging activities.....	50
Auxiliary dredging—other projects.....	50
Third locks dredging.....	52
Isthmian canal studies (Public Law No. 280).....	52
Slides.....	52
Subsidiary Dredging Division activities.....	52
Equipment.....	53
Ferry service.....	54
Investigation of means of increasing the capacity and security of the Panama Canal.....	54
Third locks project.....	56

SECTION II—BUSINESS OPERATIONS

Panama Canal business operations.....	57
Mechanical and marine work.....	57
Gross revenues—class and source.....	58
Repairs to ships.....	58
Dry docks and marine railways.....	59
Plant improvement.....	59
Electrical work.....	59
Purchases in the United States.....	60
Storehouses and ship chandlery.....	60
Obsolete and unserviceable property and equipment.....	61
Bulk petroleum products.....	61
Building construction and maintenance.....	62
Quarters of employees.....	62
Motor transportation.....	63
Panama Canal press.....	64
Subsistence.....	64
Revenues derived from the rental of lands in the Canal zone.....	64
Business operations under the Panama Railroad Co.....	65
Trans-Isthmian railroad.....	65
Receiving and Forwarding Agency.....	66
Coaling plants.....	66
Telephone system.....	67
Commissary division.....	67
Sales.....	67
Purchases.....	68
Hotels.....	68
Mindi dairy.....	68
Panama Line.....	68

SECTION III—ADMINISTRATION

Departments.....	70
Operation and maintenance.....	70
Supply.....	70
Accounting.....	70
Executive.....	71
Health.....	71
Panama Railroad Co.....	71
Changes in administrative personnel.....	71
Changes in administrative organization.....	72
Employees.....	72
Gold employees.....	73
Recruiting and turn-over in force—gold employees.....	75
Adjustment in wages and hours of work.....	76

SECTION III—ADMINISTRATION—Continued

	Page
Silver employees.....	77
Silver wages.....	78
Sick and rest leave.....	78
Cash relief for disabled silver employees.....	78
Repatriations.....	79
Central labor office.....	79
Safety program.....	80
Experiment gardens.....	81
Clubhouses.....	81
Legislation.....	82
Capital allotments, fiscal year 1948.....	83
Visit of congressional parties.....	84

SECTION IV—GOVERNMENT

Area of the Canal Zone.....	85
Population.....	85
Public health.....	86
Vital statistics.....	87
Malaria.....	88
Hospitals.....	88
Quarantine and immigration.....	89
Municipal engineering.....	90
Water system.....	90
Sewer system.....	90
Roads, streets and sidewalks.....	91
Other heavy construction activities.....	91
Cities of Panama and Colon.....	91
Miscellaneous activities.....	92
Public order.....	92
Traffic accidents and control.....	93
Magistrates' courts.....	94
Pardons and reprieves.....	94
Fire protection.....	94
Public school system.....	95
Postal system.....	97
Immigration visas.....	98
Relations with the Republic of Panama.....	98
Customs.....	98
Shipping commissioner.....	99
Administration of estates.....	99
Foreign corporations.....	100
Insurance.....	100
Licenses.....	100
Selective service registration.....	100
Commercial aviation.....	101

SECTION V—FINANCIAL AND STATISTICAL STATEMENTS

Accounting system.....	102
Operation of Panama Railroad Co.....	103
Panama Canal operations.....	103
Index to tables.....	103
Financial tables.....	104-136

OFFICIALS OF THE PANAMA CANAL AND PANAMA RAILROAD COMPANY

The following is a list of the major officials of The Panama Canal and the Panama Railroad Co. as of June 30, 1947:

THE PANAMA CANAL

Brig. Gen. J. C. Mehaffey, USA, Governor

Brig. Gen. F. K. Newcomer, USA, Engineer of Maintenance.

J. G. Claybourn, Superintendent, Dredging Division.

Col. James H. Stratton, USA, Supervising Engineer, Special Engineering Division.

Capt. P. G. Nichols, USN, Marine Superintendent, Marine Division.

F. H. Wang, Executive Secretary, Executive Department.

Col. Richardson Selee, USA, Assistant Engineer of Maintenance.

Capt. W. F. Christmas, USN, Superintendent, Mechanical Division.

L. W. Lewis, Chief Quartermaster, Supply Department.

Arnold Bruckner, Comptroller, Accounting Department.

Col. Samuel D. Avery, USA, Chief Health Officer, Health Department.

B. F. Burdick, Chief of Washington Office and General Purchasing Officer.

PANAMA RAILROAD COMPANY

Brig. Gen. J. C. Mehaffey, USA, President

Brig. Gen. F. K. Newcomer, USA, Second Vice President.

A. L. Prather, General Manager.

(NEW YORK OFFICE)

T. H. Rossbottom, Vice President.

W. R. Pfizer, Third Vice President and Secretary.

W. L. Hall, Treasurer.

REPORTS OF HEADS OF DEPARTMENTS AND DIVISIONS

APPENDIXES NOT PRINTED

The material in the annual report of the Governor of The Panama Canal, published in this volume, is to a large extent a summary of the data presented in the annual reports from the heads of departments and divisions in the Canal organization; the latter, regarded as appendixes to the report of the Governor, are not printed. The annual reports of the Panama Railroad Co. and the Health Department are published separately; the latter is compiled for calendar years only. The reports of the heads of departments and divisions, as listed below, are on file at the Washington Office of The Panama Canal and at the office of the Governor at Balboa Heights, C. Z.:

- Engineer of maintenance, report of.
 - Dredging division, report of superintendent.
 - Plans section, report of chief.
 - Safety section, report of safety engineer.
 - Special engineering division, report of supervising engineer.
- Assistant engineer of maintenance, report of.
 - Electrical division, report of electrical engineer.
 - Locks division, report of superintendent.
 - Meteorology and hydrography, section of, report of acting chief hydrographer.
 - Municipal engineering division, report of acting municipal engineer.
 - Office engineering division, report of acting office engineer.
- Accounting department, report of comptroller.
- Marine division, report of marine superintendent.
- Mechanical division, report of superintendent.
- Supply department, report of chief quartermaster.
- Executive department:
 - Civil affairs, division of, report of chief.
 - Clubhouses, Panama Canal, report of acting director.
 - General counsel, report of.
 - License bureau, report of chief.
 - Personnel supervision and management, division of, report of director of personnel.
 - Police and fire division, report of chief.
 - Schools, division of, report of superintendent.
 - Surveying officer, report of.
- Aeronautics section, report of chief.
- Collector, report of.
- Magistrates' courts:
 - Magistrate:
 - Cristobal, report of.
 - Balboa, report of.
- Pardon board, report of chairman.
- Paymaster, acting, report of.
- Public defender, report of.
- Washington Office, report of chief of office and general purchasing officer.

Digitized by the Internet Archive
in 2010 with funding from

University of Florida, George A. Smathers Libraries with support from Lyrasis and the Sloan Foundation

ANNUAL REPORT
OF THE
GOVERNOR OF THE PANAMA CANAL

BALBOA HEIGHTS, C. Z.,
November 17, 1947.

THE SECRETARY OF THE ARMY,
Washington, D. C.

SIR: I have the honor to submit the report of the Governor of The Panama Canal for the fiscal year ended June 30, 1947.

Respectfully,

J. C. MEHAFFEY, *Governor.*

INTRODUCTION

Administration of the affairs of The Panama Canal enterprises involves three main elements: (a) Operation and maintenance of the Canal itself; (b) operation of the auxiliary enterprises necessary to provide adequately for the needs of shipping and of the Canal operating forces; and (c) government of the Canal Zone, populated by American civilians, native or tropical workers and their families, and United States Army and Navy defense forces.

In addition to these normal elements, during the recent war period the Canal organization performed very important functions as a supply and service agency for the greatly expanded activities of the Army and Navy, particularly in their extensive construction programs. While the Canal organization and equipment were not designed for this duty and were by no means fully adequate, the services rendered were regarded as very creditable. These services contributed materially to the efficiency and economy of the Army and Navy operations.

The immediate supervision of the administration of these various activities rests with the heads of the nine major departments and divisions. Responsibility for administrative control of the entire organization is centered in the Governor of The Panama Canal, who is also the president of the Panama Railroad Co., an adjunct of the Canal enterprise organized as a Government-owned corporation.

By Executive order of September 5, 1939, the provisions of section 13 of the Panama Canal Act, approved August 24, 1912, were invoked as an emergency measure, and since that date the Commanding General, Panama Canal Department, United States Army, has exercised

final authority over the operation of the Panama Canal and all its adjuncts, appendants, and appurtenances, including control and government of the Canal Zone; and the Governor of The Panama Canal has been subject to that authority and the orders issued under it.

OPERATION AND MAINTENANCE OF THE CANAL

The primary function of The Panama Canal is to provide and maintain a waterway by means of which vessels may make the transit from one ocean to the other, and to handle such traffic as presents itself for transit with a maximum of safety and a minimum of delay. Essentially this involves the maintenance of the waterway, the operation of the locks, and the control of traffic through the Canal. Throughout the year the Canal force maintained its high standard for expeditious service not only in the actual transiting of ships but in providing emergency repairs, fuel, supplies, and the various supplementary services incidental to shipping. There were no interruptions of ship traffic during the year.

OPERATION OF AUXILIARY ENTERPRISES—BUSINESS OPERATIONS

Second only to the operation of the Canal is the function of supplying necessary services to shipping and the Canal operating force. These services are provided under coordinated and centralized control by the various business units of The Panama Canal and Panama Railroad Co. and include oil and coal bunkering plants; storehouses for food, ship chandlery, and other essential supplies; marine repair shops; harbor terminal facilities for passengers and for handling and transshipping cargo; a railroad line across the Isthmus; a steamship line between New York and the Canal Zone; water and electric power systems; and living quarters and retail commissary stores for the operating force.

GOVERNMENT—ADMINISTRATION

The usual functions of government, such as schools, police and fire protection, quarantine, public health, immigration service, posts, customs, aids to navigation, steamboat inspection, hydrographic and meteorological work, water supply, sewers, construction and maintenance of streets, and similar activities, which, in the United States are directed by various officers of the national, State, and municipal governments, are entrusted in the Canal Zone to the Governor, and are executed under his authority and responsibility. This centralization of all governmental activities under one head is essential to economical and efficient administration.

SERVICES RENDERED TO SHIPPING BY THE PANAMA CANAL

The principal services rendered to shipping by the Canal and its adjuncts are shown in the following table, which presents a comparison of the activities during the fiscal year 1947 with those of the preceding fiscal year and of the fiscal year 1939 which may be regarded as the last normal year preceding the outbreak of the recent war:

	Fiscal year		
	1947	1946	1939
TRAFFIC THROUGH THE PANAMA CANAL			
Number of vessels transiting the Canal:			
Ocean-going tolls-paying vessels.....	4,260	3,747	5,903
Small tolls-paying vessels (see page 37).....	847	285	914
Vessels exempt from payment of tolls (see p. 37).....	1,265	5,554	664
Total transits.....	6,372	9,586	7,481
Tolls levied:			
Ocean-going vessels.....	\$17,596,602	\$14,773,693	\$23,661,021
Small vessels.....	37,759	22,713	38,409
Total tolls.....	17,634,361	14,796,406	23,699,430
Cargo passed through Canal, carried by:	<i>Tons</i>	<i>Tons</i>	<i>Tons</i>
Ocean-going tolls-paying vessels.....	21,670,518	14,977,940	27,866,627
Small tolls-paying vessels.....	16,299	19,776	31,251
Vessels exempt from payment of tolls.....	1,001,608	7,471,446	95,265
Total cargo.....	22,688,425	22,469,162	27,993,143
Net tonnage (Panama Canal measurement) of ocean-going tolls-paying vessels.....	20,233,043	17,516,517	27,170,007
Cargo per Panama Canal net vessel ton (laden ocean-going tolls-paying vessels only).....	1.305	1.295	1.238
Average tolls per ton of cargo (laden ocean-going tolls-paying vessels only).....	\$0.689	\$0.695	\$0.727
OTHER SERVICES			
Calls at Canal Zone ports by ships not transiting the Canal.....	826	1,044	831
Cargo handled and transferred at ports (tons).....	1,492,931	1,237,155	1,580,859
Coal sales to ships (tons).....	28,989	23,189	67,865
Coal—number of vessels bunkered.....	102	72	276
Fuel oil:			
Total barrels pumped (both incoming and outgoing), excluding Panama Canal use.....	9,995,865	30,431,970	8,599,522
Number of vessels handled.....	2,089	3,655	2,063
Repairs to ships other than Panama Canal equipment:			
Number of vessels repaired.....	1,587	3,056	587
Number of vessels drydocked.....	205	228	119
Sales to ships (except U. S. Army and Navy):			
Provisions (commissary sales).....	\$1,221,529	\$5,766,265	\$307,342
Chandlery (storehouse sales).....	168,485	313,678	45,786

NET REVENUES

During the fiscal year 1947 the revenues from tolls charged to shipping using the Canal were \$17,642,146.24, and miscellaneous receipts amounted to \$109,811.83. The latter figure reflected a deficit of \$100,464.44 in postal operations. The net appropriation expenses were \$18,073,909.26, resulting in a net deficit in Canal operations proper of \$321,951.19. The business operations under The Panama Canal produced a net revenue of \$1,142,341.02. Thus a net revenue of \$820,389.83 was derived from the combined operations of the Canal and its business units during the fiscal year 1947, as compared with a net revenue of \$722,196.87 in the fiscal year 1946.

The foregoing net revenues for business operations for the fiscal year 1947 do not include an additional amount of \$583,938.42 for prior fiscal years to be deposited in the Treasury.

REPLACEMENTS

The past fiscal year marked the close of 33 years of successful operation of The Panama Canal. A very important factor contributing to this creditable record is the care that has been taken to maintain all

parts of the Canal structures and equipment in good operating condition.

Of the total capital value of The Panama Canal, approximately \$118,000,000 is the value of property of the transit divisions (which is subject to deterioration). Some of this property, including locks, dams, and other concrete structures, is still in excellent condition and requires but little expenditure for upkeep. However, other types of property, subject to more rapid deterioration, require systematic and orderly replacement as their economic life is exhausted, and appropriations must be made by Congress for this purpose, as well as for the construction of new facilities as the need therefor develops.

SECTION I

CANAL OPERATION AND TRADE VIA THE PANAMA CANAL

STATISTICS ON CANAL TRAFFIC

The number of vessels transiting the Panama Canal in the fiscal year ended June 30, 1947, including tolls-paying and those entitled to free passage, totaled 6,372, a decrease of 3,214 transits, or 33.5 percent, from the record number of 9,586 transits of the preceding fiscal year, and a decrease of 1,109 transits, or 14.8 percent, in comparison with traffic transiting in the fiscal year 1939. (See note at bottom of page.)

The following table presents a segregation of this traffic by direction of transit, together with the totals for the fiscal years 1946 and 1939:

	Fiscal year 1947			Fiscal year	
	Atlantic to Pacific	Pacific to Atlantic	Total	1946 total	1939 total
Tolls-paying transits:					
Ocean-going vessels ¹	2,021	2,239	4,260	3,747	5,903
Local vessels ²	437	410	847	285	914
Total tolls-paying transits	2,458	2,649	5,107	4,032	6,817
Tolls-free transits	537	728	1,265	5,554	664
Grand total transits	2,995	3,377	6,372	9,586	7,481

¹ Vessels of 300 net tons and over (Panama Canal measurement) for vessels rated on net tonnage, or 500 tons displacement and over for vessels rated on displacement tonnage.

² Vessels under 300 net tons (Panama Canal measurement) for vessels rated on net tonnage, or under 500 tons displacement for vessels rated on displacement tonnage.

The sharp decrease in over-all traffic in comparison with the fiscal year 1946 resulted from the diminishing volume of tolls-free traffic which decreased from 5,554 transits in 1946 to 1,265 in 1947. The greater portion of the 5,554 vessels transiting free of tolls in 1946 comprised naval and other units directly concerned with the war in the Pacific.

In contrast to the downward trend of tolls-free traffic was an increase in the traffic subject to the payment of tolls, i. e., vessels engaged in normal commerce. This traffic is discussed in subsequent paragraphs under the heading of "Ocean-Going, Tolls-Paying Traffic."

NOTE.—The normal procedure in this report is to make comparison of certain phases of the traffic under discussion with the 2 years immediately preceding. Since the fiscal year 1945 was a war year and traffic transiting during that period bears no relation to peace-time traffic, comparison of the past year's traffic is made with the preceding year and with 1939, the latter being the last fiscal year preceding the outbreak of the recent war.

The Panama Canal does not compile detailed statistics on cargo or the routing of tolls-free vessels since normally such traffic is relatively light and consists largely of war ships which do not carry cargo, Army and Navy transports, etc. Hence, except for the sections appearing under the captions "Small Tolls-Paying Vessels Transiting Canal" and "Vessels Entitled to Free Transit" on page 37, the following discussion of traffic through the Panama Canal in the fiscal year 1947 pertains only to ocean-going tolls-paying traffic.

OCEAN-GOING TOLLS-PAYING TRAFFIC

A total of 4,260 ocean-going tolls-paying vessels transited the Canal in the fiscal year ended June 30, 1947, an increase of 513 transits, or 13.7 percent, compared with the preceding fiscal year, indicating substantial progress in the reestablishment of normal shipping via the Canal. The total number of ocean-going tolls-paying transits in 1947 was approximately 72 percent of the 1939 level when 5,903 ocean-going tolls-paying vessels were passed through the Canal.

The following figures show the principal features of ocean-going tolls-paying traffic through the Canal in the past two fiscal years and in the fiscal year 1939:

	Fiscal year		
	1947	1946	1939
Number of transits.....	4,260	3,747	5,903
Net tonnage (Panama Canal measurement)	20,233,043	17,516,517	27,170,007
Cargo carried (tons of 2,240 pounds).....	21,670,518	14,977,940	27,866,627
Tolls.....	\$17,596,602	\$14,773,693	\$23,661,021

The combined movement of cargo in both directions in the fiscal year 1947 amounted to 21,670,518 long tons which represents a gain of almost 45 percent in comparison with the total passing through in the preceding fiscal year, but a decrease of slightly over 22 percent from the amount recorded in the fiscal year 1939. The substantial increase in cargo tonnage over 1946 in face of a relatively small gain in the number of transits (13.7 percent) results from the transit of a smaller number of vessels in ballast in 1947—vessels transiting without cargo represented but 19 percent of the total transits in 1947 as against 34 percent of the total making transit in 1946.

The Atlantic-to-Pacific cargo movement in 1947, totaling 8,294,820 tons, was greater by 35.6 percent than the tonnage routed in this direction in the preceding fiscal year but a decrease of 8.0 percent from the total Pacific-bound tonnage in 1939. The Pacific-to-Atlantic cargo movement, totaling 13,375,698 tons in 1947, made an increase of 51 percent over 1946 shipments in this direction, but was 29 percent under the Atlantic-bound shipments of the fiscal year 1939. One of the principal factors contributing to the failure of 1947 traffic to attain

a level nearer that existing in 1939 has been the slow recovery following cessation of hostilities of the normally important United States intercoastal trade. The tonnage of cargo moving in both directions in this trade in 1947, exclusive of that carried in tankers, was approximately 44 percent of that carried in 1939. The delay in the resumption on a larger scale of shipping in this trade is reported to arise from the intercoastal operators' inability under present high cost of operation to compete with land carriers. Recent press reports indicate that a number of intercoastal operators will discontinue operations altogether in the near future.

In tables appearing on pages 26 to 35 will be found a comparison of cargo tonnage shipped over the various trade routes, together with summaries of the principal commodities comprising these shipments. In the Atlantic-to-Pacific movement gains were recorded over all of these principal routes of trade in comparison with the preceding year. The more important of these gains occurred in tonnage routed from the east coast United States to the west coast United States which accounted for 1,466,373 tons, a gain of 69 percent in comparison with the 1946 shipments, and in tonnage shipped from the east coast United States to Asia, amounting to 1,748,608 tons in 1947, a gain of 128 percent over the fiscal year 1946.

While there was an over-all decrease of 8 percent in the Pacific-bound cargo in comparison with the fiscal year 1939, important gains were recorded in shipments over four important routes of trade, as follows: Tonnage shipped from the West Indies to the west coast of South America reached a total of 858,168 tons in 1947, which was some five times greater than the shipments of 1939 (these shipments consisting largely of mineral oils from Aruba, N. W. I.); the east coast United States to Australasia trade accounted for 688,724 tons in 1947, an increase of about 84 percent over the 374,544 tons shipped in 1939; shipments from the east coast United States to the west coast South America, aggregating 774,499 tons in 1947, were about four times as great as the 192,732 tons shipped in 1939; and shipments from the east coast United States to the Philippine Islands increased from 277,399 tons in 1939 to 453,432 tons in 1947, a gain of approximately 64 percent. Of the trade routes in which decreases were recorded in comparison with 1939, the United States intercoastal trade, accounting for 1,466,373 tons Pacific-bound in 1947, was 39 percent lower than the 1939 shipments, and the tonnage routed from eastern United States to Asia, amounting to 1,748,608 tons, was down 33 percent. (NOTE:—Shipments of scrap metal from the east coast United States to Asia, totaling 1,152,844 tons in 1939, were nothing in 1947.) Total cargo originating in Europe in 1947, totaling 650,900 tons, and destined principally to Australasia and the west coast South America, was less than half that recorded for the fiscal year 1939.

In the Pacific-to-Atlantic movement there were increases in most of the principal trade routes in comparison with the preceding year. The Atlantic-bound movement in the United States intercoastal trade,

totaling 1,463,429 tons almost doubled the shipments of 1946, and over other trade routes contributing heavy tonnage, the following gains were recorded: Shipments from the west coast South America to the east coast United States, totaling 2,700,861 tons, increased 35 percent; shipments from the west coast Canada to Europe, totaling 2,638,086 tons, increased 73 percent; shipments from the west coast United States to Europe, amounting to 1,841,143 tons, increased 12 percent; shipments from the west coast South America to Europe, amounting to 1,097,688 tons, increased 13 percent; and those from Australasia to Europe, amounting to 907,664 tons, doubled the 1946 shipments.

In comparing the Atlantic-bound cargo movement in 1947 with that of 1939 the most significant change is recorded in the United States intercoastal trade, which declined from 4,493,203 tons in 1939 to 1,463,429 tons in 1947, or about 67 percent. Other decreases of importance were in shipments from the west coast United States to Europe which decreased from 2,349,888 tons in 1939 to 1,841,143 tons in 1947, a loss of 22 percent; in the shipments from the west coast South America to Europe which decreased from 2,481,541 tons in 1939 to 1,097,688 tons in 1947, a loss of 56 percent; and in shipments from the Philippine Islands to the United States which decreased from 918,937 tons in 1939 to 356,195 tons in 1947, a loss of 61 percent. The trade routes in which the Atlantic-bound cargo movement was approximately equal or higher than in 1939 included the following: West coast of Canada to Europe, which amounted to 2,638,086 tons in 1947 compared with 2,539,436 tons in 1939; west coast South America to the east coast United States, which amounted to 2,700,861 tons in 1947 compared with 2,447,257 tons in 1939; and from Australasia to Europe, which amounted to 907,664 tons in 1947 compared with 759,794 tons in 1939.

The receipts from tolls reported to the United States Treasury for the fiscal year 1947 were \$17,642,146.24. This figure includes tolls amounting to \$37,758.78 on local tolls-paying vessels which are not included in Canal statistics covering ocean-going tolls-paying traffic. The receipts reported to the United States Treasury, moreover, include the sum of \$7,785.00 collected for a vessel transiting in a previous fiscal year. These two items account for the difference of \$45,543.78 between the tolls receipts reported to the United States Treasury and the tolls of \$17,596,602.46 shown in the following studies of traffic, which are based on tolls levied at the time of transit.

CANAL TRAFFIC BY FISCAL YEARS 1915 TO 1947

Comparative traffic statistics covering ocean-going vessels for each fiscal year since the Canal was opened to navigation are shown in the following table:

Fiscal year ended June 30—	Number of transits	Panama Canal net tonnage ¹	Tolls	Tons of cargo
1915 ²	1,058	3,507,000	\$4,366,747.13	4,888,400
1916 ³	724	2,212,000	2,403,089.40	3,093,335
1917	1,738	5,357,000	5,620,799.83	7,054,720
1918	1,989	6,072,000	6,428,780.26	7,525,768
1919	1,948	5,658,000	6,164,290.79	6,910,097
1920	2,393	7,898,000	8,507,938.68	9,372,374
1921	2,791	10,550,000	11,268,681.46	11,595,971
1922	2,665	10,556,000	11,191,828.56	10,882,607
1923	3,908	17,206,000	17,504,027.19	19,566,429
1924	5,158	24,181,000	24,284,659.92	26,993,167
1925	4,592	21,134,000	21,393,718.01	23,956,549
1926	5,087	22,906,000	22,919,931.89	26,030,016
1927	5,293	24,245,000	24,212,250.61	27,733,555
1928	6,253	27,229,000	26,922,200.75	29,615,651
1929	6,289	27,585,000	27,111,125.47	30,647,768
1930	6,027	27,716,000	27,059,998.94	30,018,429
1931	5,370	25,690,000	24,624,599.76	25,065,283
1932	4,362	21,842,000	20,694,704.61	19,798,986
1933	4,162	21,094,000	19,601,077.17	18,161,165
1934	5,234	26,410,000	24,047,183.44	24,704,009
1935	5,180	25,720,000	23,307,062.93	25,309,527
1936	5,382	25,923,000	23,479,114.21	26,505,943
1937	5,387	25,430,000	23,102,137.12	28,108,375
1938	5,524	25,950,383	23,169,888.70	27,385,924
1939	5,903	27,170,007	23,661,021.08	27,866,627
1940	5,370	24,144,366	21,144,675.36	27,299,016
1941	4,727	20,642,736	18,157,739.68	24,950,791
1942	2,688	11,010,004	9,752,207.38	13,607,444
1943	1,822	8,233,999	7,356,684.94	10,599,966
1944	1,562	6,073,457	5,456,163.32	7,003,487
1945	1,939	8,380,959	7,243,601.58	8,603,607
1946	3,747	17,516,517	14,773,692.98	14,977,940
1947	4,260	20,233,043	17,596,602.46	21,670,518
Total	130,532	585,476,471	554,528,225.61	627,503,444

¹ Panama Canal net tonnages prior to 1939 are estimated figures based on revised measurement rules which became effective Mar. 1, 1938.

² Canal opened to traffic Aug. 15, 1914.

³ Canal closed to traffic approximately 7 months of fiscal year by slides.

TRAFFIC BY MONTHS, FISCAL YEARS 1947 AND 1946

The ocean-going, tolls-paying traffic during each month of the fiscal year 1947 is summarized in the following table, in which are inserted for comparison the corresponding figures for the preceding year:

	Number of transits		Panama Canal net tonnage		Tons of cargo		Tolls	
	1946-47	1945-46	1946-47	1945-46	1946-47	1945-46	1946-47	1945-46
July.....	371	198	1,792,165	892,685	1,831,052	851,525	\$1,546,535.34	\$803,850.98
August.....	356	249	1,701,420	1,189,121	1,648,605	1,032,203	1,461,967.56	1,007,925.08
September.....	302	261	1,415,091	1,253,731	1,382,973	924,191	1,203,611.22	1,017,571.32
October.....	303	334	1,380,564	1,484,986	1,388,278	846,683	1,197,539.10	1,170,159.60
November.....	288	308	1,353,860	1,391,717	1,361,428	908,219	1,178,924.90	1,132,256.62
December.....	348	348	1,630,034	1,610,133	1,843,317	1,133,596	1,427,374.72	1,325,131.68
January.....	351	386	1,663,267	1,797,745	1,857,865	1,359,083	1,458,068.72	1,489,975.22
February.....	364	319	1,730,859	1,540,707	1,912,730	1,352,585	1,504,426.22	1,299,338.82
March.....	400	357	1,009,916	1,692,507	2,061,104	1,687,867	1,670,311.12	1,457,698.20
April.....	385	345	1,873,931	1,650,296	2,155,571	1,681,693	1,642,021.14	1,423,058.34
May.....	400	342	1,885,038	1,601,770	2,070,822	1,761,693	1,643,169.68	1,411,503.78
June.....	392	300	1,890,878	1,411,119	2,153,773	1,438,602	1,662,712.74	1,229,223.34
Total.....	4,260	3,747	20,233,043	17,516,517	21,670,518	14,977,940	17,596,602.46	14,773,692.98
Average per month.....	355	312	1,686,087	1,459,709	1,805,877	1,248,162	1,466,383.54	1,231,141.08

NATIONALITY OF VESSELS TRANSITING CANAL

Segregation of ocean-going, tolls-paying traffic ¹ through the Canal during the fiscal year 1947, by nationality, is presented in the following table which shows the number of transits, measurement tonnage, tolls, and tons of cargo:

Nationality	Number of transits	Measured tonnage			Tolls	Tons of cargo
		Panama Canal net	Registered			
			Gross	Net		
Argentine.....	9	39,826	51,005	30,131	\$33,727.82	2,200
Belgian.....	4	20,871	27,703	16,649	15,994.44	4,867
Brazilian.....	5	12,737	19,034	10,624	11,463.30	24,994
British.....	892	4,915,183	6,545,779	3,993,937	4,333,846.36	5,435,332
Chilean.....	67	259,117	364,903	240,740	232,088.94	258,765
Chinese.....	17	39,837	55,047	33,590	33,731.46	28,201
Colombian.....	19	16,928	26,239	16,150	15,235.20	18,393
Costa Rican.....	7	4,781	7,476	4,340	4,057.02	5,642
Danish.....	111	392,211	417,166	245,257	349,339.74	375,260
Ecuadorian.....	5	6,484	8,285	4,211	5,664.06	3,774
Finnish.....	1	1,757	2,518	1,419	1,581.30	2,570
French.....	61	315,619	417,611	256,470	283,113.36	377,346
Greek.....	32	152,276	196,145	120,101	132,976.26	199,415
Honduran.....	195	279,221	481,900	269,249	232,963.38	154,088
Italian.....	9	45,918	60,040	36,536	39,369.60	39,988
Mexican.....	16	32,146	46,738	28,596	26,802.18	34,858
Netherlands.....	161	411,875	540,268	320,108	400,734.94	359,108
Norwegian.....	248	1,235,154	1,475,183	878,871	1,052,601.66	1,145,745
Panamanian.....	217	728,566	1,039,420	622,485	605,139.84	657,449
Peruvian.....	15	28,872	42,811	25,211	27,338.04	28,494
Philippine Islands.....	18	82,621	95,534	57,717	73,512.00	85,753
Portuguese.....	8	41,704	46,272	30,158	34,760.16	33,220
Soviet.....	15	34,452	49,759	29,251	30,844.26	35,989
Spanish.....	40	145,380	197,787	118,334	118,451.34	146,625
Swedish.....	108	448,200	606,713	407,339	388,445.40	484,912
United States.....	1,974	10,494,241	14,604,382	8,645,698	9,098,339.04	11,712,664
Venezuelan.....	3	4,261	5,986	3,241	3,679.92	2,508
Yugoslav.....	3	12,805	16,844	9,357	10,801.44	12,358
Totals:						
1947.....	4,260	20,233,043	27,538,548	16,455,773	17,596,602.46	21,670,518
1946.....	3,747	17,516,517	23,926,245	14,338,165	14,773,692.98	14,977,940
1939.....	5,903	27,170,007	34,583,085	20,745,286	23,661,021.08	27,866,627

¹ Includes only vessels of 300 or more net tons, Panama Canal measurement, or 500 or more displacement tons on vessels rated on displacement tonnage.

CARGO CARRIED BY VESSELS OF LEADING MARITIME NATIONS

Segregating the traffic through the Canal by nationality of vessels, the following table shows the aggregate cargo carried by ships of principal maritime nations during the past two fiscal years and for the fiscal year 1939; the percentage of total cargo carried by ships of each nationality also is shown:

	1947		1946		1939	
	Tons of cargo	Per-centage	Tons of cargo	Per-centage	Tons of cargo	Per-centage
United States.....	11,712,664	54.1	8,790,676	58.7	9,909,380	35.6
British.....	5,435,332	25.1	3,606,015	24.1	6,801,556	24.4
Norwegian.....	1,145,745	5.3	864,940	5.7	3,408,078	12.2
Panamanian.....	657,449	3.0	510,708	3.4	371,721	1.3
Swedish.....	484,912	2.2	177,271	1.2	1,008,245	3.6
French.....	377,346	1.7	29,706	.2	501,752	1.8
Danish.....	375,260	1.7	47,716	.3	727,552	2.6
Netherlands.....	359,108	1.7	204,590	1.4	675,105	2.4
Chilean.....	258,765	1.2	209,447	1.4	62,904	.2
Greek.....	199,415	.9	203,833	1.4	666,471	2.4
Yugoslav.....	12,358	.1	10,600	.1	266,913	1.0
Japanese.....					1,710,303	6.2
German.....					1,468,996	5.3
All other.....					287,651	1.0
Total.....	21,670,518	100.0	14,977,940	100.0	27,866,627	100.0

VESSELS PAYING TOLLS ON DISPLACEMENT TONNAGE

In the Canal traffic statistics, foreign naval vessels such as transports, supply ships, tankers, etc., with a measurement of 300 net tons (Panama Canal measurement) or more, and vessels of war, dredges, etc., with a displacement of 500 tons or more, are classified as ocean-going, tolls-paying vessels. Statistics on these vessels, except such as pertain to displacement tonnage, have been included in the traffic summaries shown on the preceding pages. Since displacement tonnage cannot be combined with net tonnage, the following table presents statistics covering 14 vessels, which transited the Canal during the fiscal year 1947 and paid tolls on displacement tonnage.

Nationality	Type of vessel	Number of transits	Displacement tonnage	Tolls
Argentine.....	Naval.....	1	7,462	\$3,731.00
British.....	do.....	6	55,376	27,688.00
Danish.....	Training ship.....	2	2,676	1,338.00
Netherlands.....	Dredge.....	2	6,648	3,324.00
do.....	Drydock.....	1	6,050	3,025.00
Peruvian.....	Naval.....	2	3,249	1,624.50
Total.....		14	81,461	40,730.50

CLASSIFICATION OF VESSELS

The following table summarizes the ocean-going, tolls-paying traffic through the Canal during the fiscal year 1947 showing laden ships and those in ballast, and further segregated as to tankers, ore ships, passenger-carrying ships, general cargo ships, and miscellaneous vessels not engaged in normal commerce, such as naval vessels, cable ships, yachts, etc. The traffic also is segregated by direction of transit and as to vessels of United States registry and those of all other nationalities:

SUMMARY										
Cable ships, yachts, etc.:										
Number of transits.....	12	12	24	6	7	13	18	19	37	
Panama Canal net tonnage.....	9,904	8,943	18,847	6,786	8,552	15,338	16,690	17,405	34,185	
Tolls.....	\$7,858	\$7,175	\$15,033	\$5,558	\$6,137	\$11,713	\$13,416	\$13,332	\$26,748	
Total cargo and cargo-passenger ships, laden:										
Number of transits.....	696	894	1,590	767	1,073	1,840	1,463	1,967	3,430	
Panama Canal net tonnage.....	3,918,304	4,642,930	8,561,234	3,392,838	4,634,514	8,027,352	7,311,142	9,277,444	16,588,586	
Tolls.....	\$3,526,473	\$4,178,637	\$7,705,110	\$3,053,554	\$4,171,063	\$7,224,617	\$6,580,027	\$8,349,700	\$14,929,727	
Cargo (tons).....	4,699,062	7,013,602	11,712,664	3,595,758	6,362,096	9,957,854	8,294,820	13,375,698	21,670,518	
Total cargo and cargo-passenger ships, ballast:										
Number of transits.....	230	130	360	300	119	419	530	249	779	
Panama Canal net tonnage.....	1,091,143	\$23,017	1,914,160	1,096,093	600,019	1,696,112	2,187,236	1,423,036	3,610,272	
Tolls.....	\$785,623	\$592,573	\$1,378,196	\$789,186	\$432,014	\$1,221,200	\$1,574,809	\$1,024,587	\$2,599,396	
Total other type ships:										
Number of transits.....	12	12	24	³ 16	11	³ 27	³ 28	23	³ 51	
Panama Canal net tonnage.....	9,904	8,943	18,847	6,786	8,552	15,338	16,690	17,495	34,185	
Displacement tonnage.....				54,343	27,118	81,461	54,343	27,118	81,461	
Tolls.....	\$7,858	\$7,175	\$15,033	\$22,730	\$19,716	\$52,446	\$40,588	\$26,891	\$67,479	
Grand total ships:										
Number of transits.....	938	1,036	1,974	1,083	1,203	2,286	2,021	2,239	4,260	
Panama Canal net tonnage.....	5,019,351	5,474,890	10,494,241	4,495,717	5,243,085	9,738,802	9,515,068	10,717,975	20,233,043	
Displacement tonnage.....				54,343	27,118	81,461	54,343	27,118	81,461	
Tolls.....	\$4,319,954	\$4,778,385	\$9,098,339	\$3,875,470	\$4,622,793	\$8,498,263	\$8,195,424	\$9,401,178	\$17,596,602	
Cargo (tons).....	4,699,062	7,013,602	11,712,664	3,595,758	6,362,096	9,957,854	8,294,820	13,375,698	21,670,518	

¹ Vessels with accommodations for more than 12 passengers.

² Vessels with accommodations for 12 passengers or less, or without passenger accommodations.

³ Includes 2 dredges and 1 dry dock—displacement, 12,638—tolls, \$6,349.

LADEN AND BALLAST TRAFFIC BY NATIONALITY

In the table below the ships of each nationality have been segregated to show separate statistics on vessels which were carrying cargo and/or passengers at the time of transiting the Canal and those which transited in ballast:

Nationality	Laden			Ballast		
	Number of Transits	Panama Canal net tonnage	Tolls	Number of Transits	Panama Canal net tonnage	Tolls
Argentine.....	2	7,345	\$6,610.50	6	32,481	\$23,386.32
Belgian.....	1	5,374	4,836.60	3	15,497	11,157.84
Brazilian.....	5	12,737	11,463.30			
British.....	751	4,262,370	3,836,133.00	135	652,813	470,025.36
Chilean.....	62	252,915	227,623.50	5	6,202	4,465.44
Chinese.....	11	28,049	25,244.10	6	11,788	8,487.36
Colombian.....	19	16,928	15,235.20			
Costa Rican.....	5	3,415	3,073.50	2	1,366	983.52
Danish.....	104	364,499	328,049.10	5	27,712	19,952.64
Ecuadorian.....	4	5,531	4,977.90	1	953	686.16
Finnish.....	1	1,757	1,581.30			
French.....	60	310,376	279,338.40	1	5,243	3,774.96
Greek.....	25	129,653	116,687.70	7	22,623	16,288.56
Honduran.....	130	177,357	159,621.30	65	101,864	73,342.08
Italian.....	7	35,048	31,543.20	2	10,870	7,826.40
Mexican.....	12	20,317	18,285.30	4	11,829	8,516.88
Netherlands.....	155	423,533	381,179.70	3	18,342	13,206.24
Norwegian.....	184	907,171	816,453.90	64	327,983	236,147.76
Panamanian.....	144	447,624	402,861.60	73	280,942	202,278.24
Peruvian.....	12	27,365	24,628.50	1	1,507	1,085.04
Philippine Islands.....	17	77,916	70,124.40	1	4,705	3,387.60
Portuguese.....	5	26,296	23,666.40	3	15,408	11,093.76
Soviet.....	13	33,549	30,194.10	2	903	650.16
Spanish.....	21	76,543	68,888.70	19	68,837	49,562.64
Swedish.....	87	365,230	328,707.00	21	82,970	59,738.40
United States.....	1,601	8,569,364	7,712,427.60	373	1,924,877	1,385,911.44
Venezuelan.....	2	3,400	3,060.00	1	861	619.92
Yugoslavian.....	2	8,788	7,909.20	1	4,017	2,892.24
Totals:						
1947.....	3,442	16,600,450	14,940,405.00	804	3,632,593	2,615,466.96
1946.....	2,418	11,563,493	10,407,143.70	1,224	5,953,024	4,286,177.28
1939.....	4,875	22,507,503	20,256,752.70	1,005	4,662,504	3,357,002.88

AVERAGE TONNAGE, TOLLS, AND TONS OF CARGO PER CARGO-CARRYING VESSEL

The average measurement tonnage, tolls, and tons of cargo per cargo-carrying vessels of 300 net tons and over, Panama Canal measurement, transiting the Panama Canal during the past two fiscal years and in the fiscal year 1939, are shown in the following table:

	Fiscal year		
	1947	1946	1939
Measured tonnage:			
Panama Canal net.....	4,799	4,728	4,633
Registered gross.....	6,531	6,458	5,896
Registered net.....	3,902	3,870	3,537
Tolls.....	\$4,165	\$3,988	\$4,027
Tons of cargo (including vessels in ballast).....	5,148	4,043	4,754
Tons of cargo (laden vessels only).....	6,318	6,037	5,719

STEAM, MOTOR, AND OTHER VESSELS

The following table shows ocean-going, tolls-paying vessels transiting the Canal during the two past fiscal years and in the fiscal year 1939, segregated according to method of propulsion:

	Fiscal year		
	1947	1946	1939
Steamers:			
Oil burning.....	2,926	2,729	2,444
Coal burning.....	256	224	1,019
Motor ships.....	1,027	748	2,398
Not classified ¹	51	46	42
Total.....	4,260	3,747	5,903

¹ Indicates vessels not engaged in commerce.

FREQUENCY OF TRANSITS OF VESSELS THROUGH THE PANAMA CANAL

During the fiscal year 1947, 1,790 individual ocean-going, tolls-paying vessels, representing 28 nationalities, passed through the Panama Canal. In the aggregate these vessels made a total of 4,260 transits. The number of transits made by individual ships varied from 1 to 34, and averaged 2.38. The greatest number of transits, 34, was made by the United States steamer *Limon*, engaged in the banana trade between Gulf ports of the United States and Central America.

Vessels of United States registry led in the number of individual vessels transiting the Canal during the year with 782, as well as in the number of transits—1,974; those of British registry were second in number of both individual vessels and of transits, with 527 and 892, respectively.

The following table shows the number of individual ships, the frequency of transits per ship, the total number of transits for the year, and the average number of transits per individual ship, segregated by nationality:

Vessels making indicated number of transits during fiscal year 1947

Nationality	1	2	3	4	5	6	7	8	9	10	11	12	13	14	16	17	18	19	20	21	22	23	24	25	26	27	28	33	34	55	60	60	74	86	Total ships	Total Transits	Transits per ship
Argentine	9																																	9	9	1.00	
Belgian	4																																	4	4	1.00	
Brazilian	5																																	5	5	1.00	
British	398	134	46	28	5	4	1																											527	892	1.69	
Chilean	7	4	2	2	2	1	2	1																										67	17	3.19	
Chinese	13	1																																5	19	1.06	
Colombian	2				2		1																											32	111	7.00	
Costa Rican																																		1	7	3.47	
Danish	9	6	5	5	1	2	1	1		3																							2	5	2.50		
Ecuadorian	1																																	1	1	1.00	
Finnish	21	9	3	2	1																													36	61	1.69	
French	21	1	3																															25	32	1.28	
Greek	5	1																																21	95	9.28	
Honduran	5	2					4	1	2	2																								9	9	1.29	
Italian	5																																	7	8	1.29	
Mexican	35	10	3	3	1	1	1																											57	161	2.82	
Netherlands	26	15	12	8	5	5	2																											77	248	3.22	
Norwegian	32	11	4	3	2	7	1	2	1	1																								66	217	3.29	
Panamanian	9		2																															11	15	1.36	
Peruvian	3	1	3	1																														8	18	2.25	
Philippine Islands																																		3	3	1.00	
Portuguese	15																																	15	15	1.00	
Soviet																																		13	40	3.08	
Spanish	11	7		2	1	2																												34	108	3.18	
Swedish	379	212	62	45	21	15	16	5	4	2	1	1	2	5	2																			782	1,974	2.52	
United States	1																																	2	2	1.00	
Venezuelan	1																																	2	3	1.50	
Yugoslav	1	1																																2	3	1.50	
Total, 1947	931	490	147	106	42	43	26	11	7	11	1	3	3	6	3	2	2	2	2	1	1	1	3	3	1	1	1	2	2	1	1	1	1,790	4,260	2.38		
Total, 1946	1,296	333	104	89	46	31	7	11	6	6	2	2	1	1	2	2	4	4	6	3	2	1	2	1	2	1	1	1	1	1	1	1	1,952	3,747	1.92		
Total, 1939	484	415	134	135	90	11	83	69	23	20	5	2	2	3	2	4	4	6	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1,609	5,903	3.67		

The following tabulation compiled from the preceding table shows the number of vessels making a given number of transits through the Panama Canal (1 to 34), their aggregate number of transits, and their percent of the total ocean-going, tolls-paying transits:

Number of transits	Number of vessels	Total number of transits	Percent of total Canal transits (4,260)	Number of transits	Number of vessels	Total number of transits	Percent of total Canal transits (4,260)
1.....	931	931	21.9	16.....	2	32	.8
2.....	430	860	20.2	18.....	2	36	.8
3.....	147	441	10.4	20.....	1	20	.5
4.....	106	424	10.0	21.....	1	21	.5
5.....	42	210	4.8	22.....	1	22	.5
6.....	43	258	6.1	23.....	3	69	1.6
7.....	26	182	4.3	25.....	3	75	1.7
8.....	11	88	2.1	26.....	1	26	.6
9.....	7	63	1.5	27.....	1	27	.6
10.....	11	110	2.6	28.....	2	56	1.3
11.....	1	11	.3	30.....	2	60	1.4
12.....	3	36	.8	34.....	1	34	.8
13.....	3	39	.9				
14.....	6	84	1.9	Total.....	1,790	4,260	100.0
15.....	3	45	1.1				

GROSS TONNAGE OF VESSELS

The 4,260 ocean-going, tolls-paying vessels which transited the Canal in the fiscal year 1947 included 4,246 vessels rated on net tonnage, and 14 vessels rated on displacement tonnage.

Of the 4,246 vessels paying on net tonnage, 2,166, or 51 percent, were vessels ranging between 6,000 to 8,000 registered gross tons. This group was made up to a large extent of Liberty and Victory type vessels used extensively in the late war. The average registered gross tonnage of all vessels was 6,486 as compared with 6,458 in the previous fiscal year.

The following tabulation shows the ocean-going, tolls-paying vessels, excluding those rated on displacement tonnage, in groups according to registered gross tonnage, segregated by nationality, with average tonnages for 1947 and 1946 and group percentages for the fiscal year 1947:

Segregation of transits by registered gross tonnage of vessels, fiscal year 1947

Nationality	Under 2,000	2,000 to 3,999 inclusive	4,000 to 5,999 inclusive	6,000 to 7,999 inclusive	8,000 to 9,999 inclusive	10,000 to 11,999 inclusive	12,000 to 13,999 inclusive	14,000 to 15,999 inclusive	16,000 to 17,999 inclusive	Total ¹	Registered gross tonnage	Average gross tonnage per vessel, fiscal year	
												1947	1946
Argentine.....	1	1		6						8	51,005	6,376	4,300
Brazilian.....				3						4	27,703	6,926	9,402
British.....	12	14	130	549	91					5	19,034	3,807	
Chilean.....	4	9	35	4	15	62	14	4	10	886	6,515,779	7,388	7,389
Chinese.....	3	9	5							67	364,003	5,416	4,589
Colombian.....	18	1								17	55,047	3,238	5,948
Costa Rican.....	7									19	26,239	1,381	
Danish.....	49	7	30	18	5					7	7,476	1,068	1,068
Ecuadorian.....	4	1								109	417,166	3,827	3,157
Finnish.....		1								5	8,285	1,657	1,120
French.....			15	43	3					1	2,518	2,518	
Greek.....	3		22	7						61	417,611	6,846	5,624
Honduran.....	109	53	23	10						32	198,145	6,130	4,710
Italian.....			2	7						193	481,000	2,471	3,648
Mexican.....	10			4						9	63,000	6,671	
Netherlands.....	82	14	10	41	7	4				16	46,738	2,921	2,363
Norwegian.....	3	40	119	31	41	14				138	540,268	3,419	2,108
Panamanian.....	49	36	62	43	21	2	1			248	1,475,183	5,948	5,621
Peruvian.....	4				3					217	1,039,420	4,700	3,355
Philippine Islands.....		1	13	4						13	42,811	3,283	3,357
Polish.....										18	95,534	5,307	5,011
Portuguese.....			6	2							46,272	5,784	7,176
Soviet.....	8	3	1	1	1					8	49,759	3,317	6,010
Spanish.....			29	5			1			15	197,787	3,317	4,195
Swedish.....	4	32	25		30			15		40	696,713	4,045	4,914
United States.....	33	66	31	1,339	2					108	14,694,382	6,451	6,147
Venezuelan.....	2	1			379	126				1,974	14,694,382	7,398	7,219
Yugoslav.....			2	1						3	5,986	5,535	5,535
Total.....	405	307	547	2,166	598	208	15	19	11	4,246	27,538,548	6,486	6,488
Percent of total.....	9.5	7.2	12.9	51.0	13.4	4.9	0.4	0.4	0.3	100			

¹ 14 vessels rated on displacement tonnage (1 Argentine, 6 British, 2 Danish, 3 Netherlands, and 2 Peruvian) are not included.

PRINCIPAL COMMODITIES

Statistics of commodities passing through the Canal are not precise because at the time of transit it is not required that complete manifests of cargo carried by vessels be submitted to the Canal authorities. In lieu of a manifest the master of each vessel is required to submit a cargo declaration, which is a briefly itemized statement, listing the principal items of cargo carried and showing their ports or country of origin and destination. These cargo declarations form the basis of the commodity statistics. There is a natural tendency not to list small miscellaneous shipments but to include them under the head of general cargo. Hence, except in the case of commodities commonly shipped in bulk, such as mineral oils carried in tank ships, wheat, lumber, nitrate, etc., aggregate shipments of the various commodities are likely to be excess of the tonnage reported during the year and shown in the annual summary. Subject to errors arising from this source, the tonnage of the principal commodities shipped through the Canal during the fiscal years 1947, 1946, and 1939 is shown in the following table:

[All figures in long tons of 2,240 pounds]

Commodity	Fiscal year		
	1947	1946	1939
ATLANTIC TO PACIFIC			
Mineral oils.....	2,200,916	2,297,848	1,032,671
Manufactures of iron and steel.....	1,082,272	549,644	1,495,497
Paper and paper products.....	359,050	222,847	402,264
Sulphur.....	309,586	156,535	234,879
Cotton, raw.....	273,721	217,839	250,752
Cement.....	201,460	38,764	160,271
Flour.....	200,305	84,357	23,445
Machinery.....	170,155	70,724	158,835
Tinplate.....	163,820	76,996	194,186
Phosphates.....	156,212	172,463	202,981
Automobiles.....	135,530	86,950	152,131
Rice.....	133,905	71,596	14,887
Canned food products.....	121,988	79,843	132,228
Nitrate.....	113,035	3,239	54,181
Chemicals, unclassified.....	99,833	63,687	127,858
Coal and coke.....	91,503	48,853	147,273
Ammonium compounds.....	81,364	3,991	51,062
Metals, various.....	80,969	45,202	400,285
Wheat.....	80,831	40,517	2,604
Sugar.....	79,793	47,961	36,832
Coffee.....	74,174	58,228	73,314
Automobile parts and accessories.....	72,952	31,440	80,693
Asphalt.....	68,301	32,047	71,931
Tobacco.....	64,894	30,422	64,441
Ores, various.....	62,442	1,336	45,620
Textiles.....	58,230	26,885	98,325
Salt.....	58,212	18,982	54,751
Woodpulp.....	45,249	32,599	59,834
Electrical apparatus.....	38,954	13,343	39,207
Liquors and wines.....	37,336	24,869	74,093
Groceries, miscellaneous.....	35,580	13,241	24,794
Agricultural implements.....	34,939	20,340	43,276
Creosote.....	33,381	35	26,399
Railroad material.....	32,247	18,098	82,235
Soda and sodium compounds.....	31,809	20,808	39,694
Lumber and mill products.....	30,533	36,280	58,157
Paints and varnishes.....	28,660	15,659	36,057
Fertilizers, unclassified.....	26,697	8,829	20,633
Floor coverings.....	26,506	10,263	27,237
Beer.....	22,908	35,673	4,561
Drugs and medicines.....	21,097	12,312	29,114
Rosin.....	20,299	11,293	41,303
Glass and glassware.....	19,537	6,219	60,005
Asbestos.....	12,694	12,734	35,395
Slag.....	12,328	147	26,769
Oils, vegetable.....	10,914	3,154	32,002
Potash.....	8,595	8,695	27,859
Soaps and products.....	7,878	10,459	28,630
Oilseed cake and meal.....	5,483	146	27,504

[All figures in long tons of 2,240 pounds]

Commodity	Fiscal year		
	1947	1946	1939
ATLANTIC TO PACIFIC—continued			
Sand.....	5,331	78	25,788
Oilseeds.....	5,319	6,088	45,676
Meat, refrigerated.....	1,760	25,991	3,998
Scrap metal.....	989	400	1,200,368
All others.....	1,142,344	1,190,236	1,126,482
Total.....	8,294,820	6,118,085	9,011,267
PACIFIC TO ATLANTIC			
Lumber and mill products.....	2,340,696	1,251,393	3,191,093
Ores, various.....	2,184,650	1,289,705	1,991,690
Wheat.....	1,489,622	1,359,611	1,539,474
Nitrate.....	1,294,226	1,325,020	1,444,148
Canned food products.....	713,040	474,381	1,232,636
Metals, various.....	630,047	422,808	674,314
Food products in refrigeration ¹	514,026	273,541	335,874
Coal and coke.....	413,486	228,260	413
Bananas.....	331,266	245,369	45,557
Iron and steel manufactures.....	323,476	110,577	8,466
Copra.....	301,187	9,492	156,657
Wool.....	284,633	99,310	138,622
Mineral oils.....	236,895	192,941	2,777,201
Coffee.....	218,924	152,599	185,341
Rice.....	144,723	61,089	31,127
Sugar.....	142,728	161,790	1,329,276
Fruit, dried.....	116,625	79,741	337,769
Flour.....	111,060	61,438	153,642
Oats.....	89,202	9,620	102,650
Fruit, fresh.....	81,861	45,751	419,109
Cotton, raw.....	77,673	63,977	106,211
Oils, vegetable.....	63,366	17,011	174,944
Wood pulp.....	60,027	40,319	235,768
Molasses.....	57,690	14,956	101,750
Skins and hides.....	51,596	28,957	58,760
Beans, edible.....	49,083	49,317	165,185
Fertilizers, unclassified.....	41,933	26,680	7,601
Hemp, unmanufactured.....	41,328	22,049	24,293
Machinery.....	39,952	9,250	10,065
Rubber, crude.....	39,054	22,862	24,934
Asphalt.....	35,509	11,008	61,861
Paper and paper products.....	34,647	16,896	120,723
Borax.....	34,153	10,666	74,239
Groceries, miscellaneous.....	33,301	22,133	13,640
Grains, miscellaneous and unclassified.....	31,380	106,209	2,503
Ammonium compounds.....	26,686	11,272	3,473
Sand.....	26,168	10,438	1,350
Peas, dry.....	26,042	15,399	16,585
Tallow.....	22,786	9,863	30,864
Barley.....	16,256	15,528	259,612
Coconuts.....	15,277	759	27,064
Wines.....	13,390	8,978	29,879
Phosphates.....	8,062	15,467	87,715
Potash.....	5,542	3,222	48,287
Oilseed cake and meal.....	4,996	20	62,025
Textiles.....	1,924	2,364	30,986
Fish oil.....	801	197	34,433
Porcelainware.....	681	77	25,324
Fish meal.....	90	-----	32,473
Soya beans.....	-----	-----	236,069
Guano.....	-----	-----	27,830
All other.....	553,935	449,636	622,925
Total.....	13,375,698	8,859,855	18,855,360

¹ Does not include fresh fruit.

ORIGIN AND DESTINATION OF CARGO SEGREGATED BY COUNTRIES IN PRINCIPAL TRADE AREAS

The following tables show the origin and destination, by countries in the principal trade areas, of cargoes carried by vessels passing through the Canal during the past year; one table covers the movement of cargo from the Atlantic to the Pacific and the other from the Pacific to the Atlantic:

Origin and destination of cargo through the Panama Canal from Atlantic to Pacific during fiscal year 1947 segregated by countries in principal trade areas

From—	To west coast North America					To west coast South America							
	United States	Canada	Central America/Mexico	Balboa, C. Z. 1	Hawaiian Islands	Total	Chile	Colombia	Ecuador	Peru	Argen- tine, Uruguay, Brazil 4	South 2 America	Total
East coast North America:	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
	United States:												
	North Atlantic ports.....	1,135,193				1,276,133	230,264	117,999	58,202	132,296		47,634	586,395
	South Atlantic ports.....	27,555				32,572	73,655	27,123	16,705	33,362		37,259	188,104
	Gulf ports.....	303,625	36,843	15,065	43,718	583,998							
	Total, United States.....	1,466,373	36,843	36,977	81,657	1,891,803	303,919	145,122	74,907	165,658		84,893	774,499
	Canada.....	54,445				54,445							
	Central America/Mexico.....			27,800	135	27,935	28	388		90			506
	Cristobal, C. Z. 1.....	5,017		90,562		95,579	1,446	9,189	3,838	1,654	2,521	4,203	22,851
	West Indies.....	31,378	24,052	120,559	242,938	43,719	800,339	13,926	2,222	38,265	113	1,283	858,168
Europe:	Total, North America.....	1,557,213	60,895	275,898	324,730	2,532,408	1,105,752	170,625	80,967	205,667	2,634	90,379	1,656,024
	British Isles.....	30,340	38,343			68,683	31,843	6,381	12,179	28,566		639	79,608
	Belgium.....	6,004	5,328			37,381	6,629	9,175	5,185	9,952		2,716	33,657
	Denmark.....	842	171	12,794		12,842	10	7,211	832	1,208			9,261
	France.....	8,189	2,410	11,829		12,090	2,761	1,466	106	5,971		2,007	12,311
	Germany.....	1,226				1,226							
	Italy.....	2,219				2,219	2,516		88	690		99	3,393
	Netherlands.....	1,602	139			738	738	1,170		333			2,241
	Norway.....	8,886	310	786		1,741	5,552	2,334	1,301	3,450			12,637
	Spain and Portugal.....			14		898	1,541	14	12	486		37	1,065
East coast South America:	Sweden.....	9,532		7,000		9,982	34,039	8,822	1,662	14,109			3,405
	Europe (other) 3.....	12,240	867	1,690	527	15,324							58,632
	Total, Europe.....	81,080	47,568	23,614	26,372	178,634	85,516	38,100	21,379	65,717		5,498	216,210
	Argentina.....												
	Brazil.....	21,615	2,235		304	24,154	85	3,654	1,033	230		6	5,008
	Colombia.....	71,793	277			72,070	128	989	9	157			1,283
	Venezuela.....	8,678	9,385	8,975		27,038	301	19,722	509			286	20,818
	South America (other) 3.....	63	11,372	11,435		11,435	70	297	10	26		7	410
	Total, South America.....	4,422	4,638			8,460	145	307	60	1,586			2,554
	Asia.....	106,571	27,307	9,279		143,157	729	24,969	1,621	1,999	7	748	30,073
Africa:		222				222							
	Grand total.....	1,745,086	135,770	298,912	360,381	2,853,821	1,191,997	233,694	103,967	273,383	2,641	96,625	1,902,307
Percent of Pacific-bound cargo.....		21.0	1.6	3.6	4.4	34.4	14.4	2.8	1.3	3.3	0.1	1.0	22.9

1 Includes both local and transshipped cargo.

2 Cargo not routed to permit segregation between definite countries.

3 Also includes cargo not routed to permit segregation between definite countries.

4 Via Strait of Magellan.

REPORT OF GOVERNOR OF THE PANAMA CANAL

Origin and destination of cargo through the Panama Canal from Atlantic to Pacific during fiscal year 1947 segregated by countries in principal trade areas—Continued

From—	To Australasia				To Asia					Grand total	Percent of total Pacific-bound cargo
	Australia	New Zealand	Australasia (other) ¹	Total	Philippine Islands	China	Japan	East Indies	Asia (other) ²	Total	
East coast North America:											
United States:											
North Atlantic ports.....	Tons 250,002	Tons 87,989	Tons 15,090	Tons 353,080	Tons 290,516	Tons 627,088	Tons 49,407	Tons 29,479	Tons 70,451	Tons 1,037,001	39.2
South Atlantic ports.....	2,777			2,777	4,645	24,906	49,035	70		78,656	1.4
Gulf ports.....	169,118	120,327	43,412	332,857	188,271	456,737	384,342	23,285	33,748	1,086,383	26.4
Total, United States.....	421,897	208,316	58,511	688,724	483,432	1,108,731	482,844	52,834	104,199	2,202,040	67.0
Canada.....	155,276	79,147		234,423	3,027	24,332		671		316,898	3.8
Central America/Mexico.....										28,441	.3
Cristobal, C. Z. I.....										118,430	1.4
West Indies.....	41,857	30,024	307	72,188	14,840	10,969	21,620			47,429	17.4
Total, North America.....	619,030	317,487	58,818	995,335	471,299	1,144,032	504,461	53,505	104,199	2,277,499	80.9
Europe:											
British Isles.....						4,514				5,568	4.5
Belgium.....	1,298	218,543	4,514	223,087	1,054					79,748	1.0
Denmark.....		7,412		8,710						22,103	.3
France.....		160	7,598	7,740						32,141	.4
Germany.....										11,025	.1
Italy.....	12				79	74	6,736		4,289	12,251	.1
Netherlands.....		198		198					75	228	.1
Norway.....										5,840	.1
Spain and Portugal.....										4,180	.1
Sweden.....		100		100						22,619	.3
Europe (other) ¹										20,063	.3
Total, Europe.....	1,310	226,413	12,112	239,835	1,133	4,588	6,736		4,364	73,956	.8
East coast South America:											
Argentina.....										16,821	7.9
Brazil.....											
Colombia.....										29,162	.4
Venezuela.....										73,353	.9
South America (other) ¹										47,856	.6
Total, South America.....										11,014	.1
Total, South America.....										173,220	2.1
Asia.....											
Africa.....											
Total, Asia.....										222	.1
Grand total.....	620,340	553,102	70,930	1,244,372	472,432	1,148,620	511,200	53,505	108,563	2,204,320	
Percent of Pacific-bound cargo.....	7.5	6.6	0.9	15.0	5.7	13.8	6.3	0.6	1.3	27.7	100.0

¹ Includes both local and transshipped cargo.

² Also includes cargo not routed to permit segregation between definite countries.

Origin and destination of cargo through the Panama Canal from Pacific to Atlantic during fiscal year 1947 segregated by countries in principal trade areas

From—	To United States				To other North America				To Europe				
	North Atlantic ports	South Atlantic ports	Gulf ports	Total	Canada	Central America/Mexico	Cristobal, C. Z. 1	West Indies	Total North America	British Isles	Belgium	Denmark	France
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
West coast, North America:													
United States	1,367,470	16,361	79,598	1,463,429					1,658,799	453,905	151,985	18,687	309,035
Canada	24,944	31		25,023		18,620	4,864	171,886	51,559	2,108,126	54,716	13,217	82,530
Bahboa, C. Z. 1	3,454	270	2,669	6,393				1	22				
Central America/Mexico	6,959	5,372	296,163	308,494				14,759	400,389		450	16	
Hawaiian Islands	172,014		29,559	201,573	5,399		71,737		221,761	2,318			
Total, North America	1,574,921	22,034	407,989	2,004,944	25,557	18,620	77,463	212,340	2,338,924	2,624,349	207,151	31,920	391,565
West coast, South America:													
Chile	1,870,135	133,094	329,830	2,333,059		9,786	4,980	58,848	2,406,673	151,103	36,427	44,211	193,025
Colombia	96,573	2,595	34,658	133,826		27	19,180	385	153,418				829
Ecuador	29,419	16,991	11,799	58,209		12	16,807	23,978	99,006	368	7	303	1,893
Peru	135,247	429	29,641	165,317	8,423		959	3,028	177,727	89,991	21,229	1,009	30,613
South America 2	3,552		6,898	10,450		568	733	217	11,968	2,977			
Total, South America	2,134,926	153,109	412,826	2,700,861	8,423	10,393	42,659	86,456	2,848,792	244,439	60,666	45,523	226,360
Australasia:													
Australia	145,332			145,332	47,136				195,408	108,142	25,372		
New Zealand	43,220			43,220	18,626			2,940	62,589	626,844	15,485		
Australasia (other) 3	8,050			8,050				743	8,050	70,981			37,051
Total, Australasia	196,602			196,602	65,762			3,683	266,047	815,967	40,857		37,051
Asia:													
Philippine Islands	228,501		127,694	356,195		1,500	35		357,730				
China	65,662			65,662	33		11	180	65,886				
Japan	49,418			49,418					49,418				
East Indies	20,043		7,340	27,383					27,383				
Asia (other) 3	13,703			13,703					13,703				
Total, Asia	377,327		135,034	512,361	33	1,500	46	180	514,120				
Grand total	4,283,776	175,143	955,849	5,414,768	99,775	30,513	120,168	302,659	5,967,883	3,084,755	308,674	77,443	654,976
Percent of Atlantic-bound cargo	32.0	1.3	7.2	40.5	0.7	0.2	0.9	2.3	44.6	27.5	2.3	0.6	4.9

¹ Includes both local and transshipped cargo.

² Cargo not routed to permit segregation between definite countries.

³ Also includes cargo not routed to permit segregation between definite countries.

Origin and destination of cargo through the Panama Canal from Pacific to Atlantic during fiscal year 1947 segregated by countries in principal trade areas—Continued

From—	To Europe						To South America			
	Germany	Italy	Nether-lands	Norway	Spain and Portugal	Sweden	Europe (other) ²	Total	Argentina	Brazil
West coast, North America:										
United States.....	Tons 40,377	Tons 282,801	Tons 144,789	Tons 11,981	Tons 13,897	Tons 101,216	Tons 312,470	Tons 1,811,143	Tons 59,148	Tons 33,330
Canada.....	10,107	28,705	175,323	6,543		943	97,876	2,658,066	8,406	8,645
Bahama, C. Z. ¹										
Central America/Mexico.....					39	2,976	7,949	28,063		
Hawaiian Islands.....			11,943	1,690			8,918	11,236		
Total, North America.....	50,484	311,506	335,055	20,214	13,936	105,135	427,213	4,518,528	67,554	41,981
West coast, South America:										
Chile.....	32,415	95,519	100,683	1,500	150,574	45,551	35,203	886,301		
Colombia.....						926		1,762		
Ecuador.....		1,118	565	292		336	870	8,738		6
Peru.....	2	7,265	9,800	868	8,118	2,704	25,755	197,884		
South America ¹		90					416	3,453		
Total, South America.....	32,417	104,052	111,048	2,750	158,692	49,517	62,274	1,097,688		6
Australasia:										
Australia.....										
New Zealand.....	8,482					5,307		138,871		
Australasia (other) ¹								600,811		
Total, Australasia.....	8,482					5,307		907,684		
Asia:										
Philippine Islands.....										
China.....										
Japan.....										
East Indies.....										
Asia (other) ¹							2,922	2,922		
Total, Asia.....							2,922	2,922		
Grand total.....	91,383	415,538	416,103	22,961	172,628	159,959	492,359	6,538,862	67,554	40,990
Percent of Atlantic-bound cargo.....	0.7	3.2	3.3	6.2	1.3	1.2	3.6	48.8	0.5	0.3

¹ Includes both local and transshipped cargo.

² Cargo not routed to permit segregation between definite countries.

³ Also includes cargo not routed to permit segregation between definite countries.

From—	To South America				Asia	To Africa			Grand total	Percent of total Atlantic-bound cargo
	Colombia	Venezuela	South America (other) ²	Total		British South Africa	Egypt	Africa (other) ³		
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	
West coast, North America:										
United States.....	11,733	6,660	39,820	150,700	7,811	80,891	4,670	14,993	3,759,007	28.1
Canada.....	2,537	1,407	39,015	25,659	25,659	195,807	15,343	12,879	2,981,348	22.3
Balboa, C. Z. 1.....		2,500		2,500					8,916	1.1
Central America/Mexico.....		346		346	5,248				428,798	3.2
Hawaiian Islands.....									238,245	1.7
Total, North America.....	14,270	10,913	57,840	192,561	41,718	276,698	20,013	27,872	7,416,314	55.4
West coast, South America:										
Chile.....	2,645	6,738		9,522			260,826	1,596	3,564,918	26.7
Colombia.....	5,309		139	5,315					180,495	1.2
Ecuador.....	476	9,324	3	9,803	980			984	119,531	.9
Peru.....	1,559	11,005	6,279	18,843	9,420				403,374	3.0
South America 2.....									15,451	.1
Total, South America.....	9,989	27,067	6,421	43,483	10,400		260,826	2,580	4,263,769	31.9
Australasia:										
Australia.....									334,229	2.5
New Zealand.....									723,400	5.4
Australasia (other) 3.....									116,082	.9
Total, Australasia.....									1,173,711	8.8
Asia:										
Philippine Islands.....	4,000			4,000					361,730	2.7
China.....									65,886	.5
Japan.....									49,418	.4
East Indies.....									27,383	.2
Asia (other) 3.....		862		862					17,487	.1
Total, Asia.....	4,000	862		4,862					521,904	3.9
Grand total.....	28,259	38,842	64,261	240,906	52,118	276,698	280,839	30,452	13,375,698	100.0
Percent of total Atlantic-bound cargo.....	0.2	0.3	0.5	1.8	0.4	2.1	2.1	0.2	100.0	

1 Includes both local and transhipped cargo.

2 Cargo not routed to permit segregation between definite countries.

3 Also includes cargo not routed to permit segregation between definite countries.

CARGO SHIPMENTS SEGREGATED BY TRADE ROUTES

The following tables present, by direction of movement, cargo tonnage passing through the Canal over various trade routes, together with the principal commodities making up these shipments, for the past two fiscal years and for the fiscal year 1939:

TOTAL CARGO SHIPMENTS

ATLANTIC TO PACIFIC

[Tons of 2,240 pounds]

	Fiscal year		
	1947	1946	1939
East coast United States to:			
West coast United States	1,466,373	865,510	2,391,523
West coast Canada	36,843	40,497	22,292
West coast Central America/Mexico	36,977	24,755	31,710
West coast South America	774,499	609,705	192,732
Hawaiian Islands	269,953	118,824	141,804
Australasia	688,724	609,679	374,544
Philippine Islands	453,432	265,380	277,399
Asia (excluding Philippine Islands)	1,748,608	765,164	2,593,808
Balboa, C. Z.	81,657	24,942	8,514
Total from east coast United States	5,557,066	3,324,456	6,034,326
East coast Canada to:			
West coast United States	54,445		26,287
West coast Canada		5,182	46,893
Australasia	234,423	164,060	222,720
Asia (excluding Philippine Islands)	25,003	14,979	50,943
Other territories	3,027	629	1,567
Total from east coast Canada	316,898	184,850	348,410
East coast Central America/Mexico to:			
West coast Central America/Mexico	27,800	16,937	74,857
Other territories	641	26,519	43,695
Total from east coast Central America/Mexico	28,441	43,456	118,552
East coast South America to:			
West coast United States	106,571	72,761	110,521
West coast Canada	27,307	51,858	6,202
West coast South America	30,073	28,312	152,649
Asia (excluding Philippine Islands)			124,724
Other territories	9,279	11,657	12,943
Total from east coast South America	173,230	164,588	407,039
Cristobal, C. Z. to:			
West coast Central America/Mexico	90,562	49,048	50,907
West coast South America	22,851	19,310	135,986
Other territories	5,017	10,893	26,854
Total from Cristobal	118,430	79,251	213,747
West Indies to:			
West coast United States	31,378	58,974	10,064
West coast Central America/Mexico	120,559	155,900	15,342
West coast South America	858,168	651,020	177,714
Balboa, C. Z.	242,938	795,354	65,307
Australasia	72,188	315,353	21,942
Asia (excluding Philippine Islands)	32,589		19,892
Hawaiian Islands	43,719	4,680	
Other territories	38,892	8,912	8,673
Total from West Indies	1,440,431	1,990,193	318,934
Europe to:			
West coast United States	81,080	18,061	337,401
West coast Canada	47,568	4,062	78,789
West coast Central America/Mexico	23,014	2,258	91,873
West coast South America	216,210	58,651	415,697
Australasia	239,835	207,177	542,770
Balboa, C. Z.	26,372	3,346	12,487
Other territories	16,821	7,736	46,781
Total from Europe	650,900	331,291	1,525,798
Asia and Africa to other territories	9,424		44,461
Total cargo—Atlantic to Pacific	8,294,820	6,118,085	9,011,267

TOTAL CARGO SHIPMENTS—Continued

PACIFIC TO ATLANTIC

[Tons of 2,240 pounds]

	Fiscal year		
	1947	1946	1939
West coast United States to:			
East coast United States.....	1,463,429	787,424	4,493,203
East coast South America.....	150,700	64,546	45,222
Cristobal, C. Z.....	4,864	2,825	55,073
West Indies.....	171,886	83,240	487,189
Europe.....	1,841,143	1,650,726	2,349,888
Africa.....	100,554	36,050	44,859
Other territories.....	26,431	13,035	46,151
Total from west coast United States.....	3,759,007	2,637,846	7,521,585
West coast Canada to:			
East coast United States.....	25,025		201,619
East coast Canada.....		3,366	56,398
West Indies.....	25,673	5,066	31,571
East coast South America.....	39,015	19,310	13,237
Europe.....	2,638,086	1,527,995	2,539,436
Asia.....	28,659		385
Africa.....	224,029	201,252	26,910
Other territories.....	861		3,896
Total from west coast Canada.....	2,981,348	1,756,989	2,873,452
West coast Central America/Mexico to:			
East coast United States.....	308,494	256,487	30,649
Cristobal, C. Z.....	71,737	31,442	43,472
Europe.....	28,063	12,928	48,116
Other territories.....	20,504	12,264	1,353
Total from west coast Central America/Mexico.....	428,798	313,121	123,590
West coast South America to:			
East coast United States.....	2,700,861	1,997,815	2,447,257
East coast Canada.....	8,423	17,071	132,364
East coast South America.....	43,483	41,585	12,464
Cristobal, C. Z.....	42,659	33,598	143,186
West Indies.....	86,456	59,852	103,903
Europe.....	1,097,688	970,455	2,481,541
Africa.....	263,406	131,658	24,180
Other territories.....	20,793	19,255	220
Total from west coast South America.....	4,263,769	3,271,289	5,345,115
From Balboa, C. Z.: Total.....	8,916		
Hawaiian Islands to:			
East coast United States.....	201,603	101,823	361,857
East coast Canada.....	20,158		
Europe.....	11,236		79,174
Other territories.....	5,248		
Total from Hawaiian Islands.....	238,245	101,823	441,031
Australasia to:			
East coast United States.....	196,632	237,679	86,999
East coast Canada.....	65,732	31,945	87,546
Europe.....	907,664	457,812	759,794
Other territories.....	3,683	13	12,001
Total from Australasia.....	1,173,711	727,449	946,340
Philippine Islands to:			
East coast United States.....	356,195	31,256	918,937
To other territories.....	5,535		2,525
Total from Philippine Islands.....	361,730	31,256	921,462
Asia to:			
East coast United States.....	156,166	20,082	280,593
Europe.....	2,922		363,048
Other territories.....	1,086		39,144
Total from Asia.....	160,174	20,082	682,785
Total cargo—Pacific to Atlantic.....	13,375,698	8,859,855	18,855,360

IMPORTANT COMMODITY SHIPMENTS OVER PRINCIPAL TRADE ROUTES

ATLANTIC TO PACIFIC

[Tons of 2,240 pounds]

	Fiscal year		
	1947	1946	1939
East coast United States to west coast United States:			
Canned food products.....	27,866	23,696	94,119
Chemicals, unclassified.....	16,811	14,160	48,743
Electrical apparatus.....	13,585	4,019	22,028
Floor coverings.....	20,691	9,124	24,112
Iron and steel manufactures.....	633,785	322,734	784,485
Machinery.....	19,895	6,050	28,958
Mineral oils.....	194,916	98,939	138,680
Paints.....	13,781	6,525	13,768
Paper and paper products.....	61,406	44,848	129,607
Phosphates.....	17,701	14,529	6,733
Sulfur.....	66,607	27,159	133,017
Tinplate.....	9,846	2,560	67,839
All other and unclassified.....	369,483	291,158	899,425
Total.....	1,466,373	865,510	2,391,523
East coast United States to west coast Canada:			
Sulfur.....	30,005	25,600	4,000
All other and unclassified.....	6,838	14,897	18,292
Total.....	36,843	40,497	22,292
East coast United States to west coast Central America/Mexico. (No single outstanding commodity in this trade.)			
East coast United States to west coast South America:			
Agricultural implements.....	13,088	8,970	4,609
Automobiles and parts.....	65,359	32,374	13,223
Canned food products.....	20,153	8,478	2,404
Cement.....	48,441	20,502	2,544
Chemicals, unclassified.....	15,774	14,902	3,607
Coal.....	52,198	29,216	2,023
Flour.....	32,379	9,182	264
Iron and steel manufactures.....	168,541	106,987	63,719
Lubricating oils and greases.....	25,350	16,691	13,975
Machinery.....	60,763	34,080	16,473
Paper and paper products.....	21,008	15,717	905
Railroad material.....	11,589	8,592	12,238
Wheat.....	13,506	11,662	70
All other and unclassified.....	226,350	292,352	56,678
Total.....	774,499	609,705	192,732
East coast United States to Hawaiian Islands:			
Iron and steel manufactures.....	12,808	13,231	21,015
Mineral oils.....	131,496	-----	60
Tinplate.....	41,718	33,215	37,916
All other and unclassified.....	83,931	72,378	82,813
Total.....	269,953	118,824	141,804
East coast United States to Australasia:			
Automobiles and parts.....	45,649	7,135	51,839
Mineral oils.....	151,573	88,238	67,844
Phosphates.....	62,587	138,280	-----
Rosin.....	10,863	6,525	4,938
Sulfur.....	193,496	102,200	95,637
Tinplate.....	74,540	28,782	383
All other and unclassified.....	150,016	238,519	153,903
Total.....	688,724	609,679	374,544
East coast United States to Philippine Islands:			
Automobiles and parts.....	17,758	7,208	14,959
Canned food products.....	19,732	5,934	3,720
Flour.....	36,734	14,690	2,179
Iron and steel manufactures.....	36,400	19,932	96,497
Mineral oils.....	36,302	7,029	9,033
Rice.....	104,107	47,052	362
Textiles.....	10,645	4,737	10,001
All other and unclassified.....	191,754	158,798	140,648
Total.....	453,432	265,380	277,399

IMPORTANT COMMODITY SHIPMENTS OVER PRINCIPAL TRADE ROUTES—Continued

ATLANTIC TO PACIFIC—Continued

[Tons of 2,240 pounds]

	Fiscal year		
	1947	1946	1939
East coast United States to Asia (excluding Philippine Islands):			
Ammonium compounds.....	74,658	300	3,266
Automobiles and parts.....	18,034	45,397	42,865
Canned food products.....	38,667	35,645	705
Chemicals, unclassified.....	23,419	15,560	9,518
Coal.....	27,290	62	-----
Copper (metal).....	2,606	2,063	40,615
Cotton, raw.....	261,551	204,537	175,934
Flour.....	122,471	48,589	2,917
Iron (metal pigs).....	5,680	218	197,872
Iron and steel manufactures.....	139,482	43,755	208,562
Machinery.....	42,889	11,508	38,520
Mineral oils.....	256,354	88,887	298,289
Nitrate.....	105,632	1,381	4,718
Paper and paper products.....	34,497	16,325	3,335
Phosphates.....	49,889	3,762	139,197
Railroad material.....	13,074	8,829	10,343
Rice.....	29,025	22,161	100
Scrap metal.....	-----	80	1,152,844
Sulphur.....	19,266	1,322	-----
Tinplate.....	12,142	4,098	33,027
Tobacco and manufactures.....	42,241	11,464	32,265
Wheat.....	67,211	28,855	2,267
All other and unclassified.....	362,530	170,366	196,649
Total.....	1,748,608	765,164	2,593,808
East coast United States to Balboa, C. Z.:			
Cement.....	36,136	-----	-----
Mineral oils.....	42,317	13,316	3,051
All other and unclassified.....	3,204	11,626	5,463
Total.....	81,657	24,942	8,514
East coast Canada to west coast United States:			
Copper and lead concentrates.....	54,149	-----	15,809
All other and unclassified.....	296	-----	10,478
Total.....	54,445	-----	26,287
East coast Canada to west coast Canada. (No single out- standing commodity in this trade.)			
East coast Canada to Australasia:			
Automobiles and parts.....	20,755	12,444	26,070
Paper and paper products.....	160,697	96,405	139,836
All other and unclassified.....	52,971	55,211	56,814
Total.....	234,423	164,060	222,720
East coast Canada to Asia. (No single outstanding com- modity in this trade.)			
East coast Central America/Mexico to west coast Central America/Mexico:			
Mineral oils.....	27,789	16,443	63,287
All other and unclassified.....	11	494	11,570
Total.....	27,800	16,937	74,857
East coast South America to west coast United States:			
Coffee.....	70,592	46,231	45,113
All other and unclassified.....	35,979	26,530	65,408
Total.....	106,571	72,761	110,521
East coast South America to west coast Canada:			
Mineral oils.....	20,391	51,669	-----
All other and unclassified.....	6,916	189	6,202
Total.....	27,307	51,858	6,202

IMPORTANT COMMODITY SHIPMENTS OVER PRINCIPAL TRADE ROUTES—Continued

ATLANTIC TO PACIFIC—Continued

[Tons of 2,240 pounds]

	Fiscal year		
	1947	1946	1939
East coast South America to west coast South America:			
Mineral oils.....	219	155	131,008
All other and unclassified.....	29,854	28,157	21,641
Total.....	30,073	28,312	152,649
East coast South America to Asia:			
Cotton.....			71,545
All other and unclassified.....			53,179
Total.....			124,724
Cristobal to west coast Central America/Mexico. (No single outstanding commodity in this trade.)			
Cristobal to west coast South America. (No single outstanding commodity in this trade.)			
West Indies to west coast United States:			
Mineral oils.....	30,909	33,180	
All other and unclassified.....	469	25,794	10,064
Total.....	31,378	58,974	10,064
West Indies to west coast Central America/Mexico:			
Mineral oils.....	112,440	155,380	15,269
All other and unclassified.....	8,119	520	73
Total.....	120,559	155,900	15,342
West Indies to west coast South America:			
Mineral oils.....	792,818	613,531	165,573
Sugar.....	54,614	25,599	11,423
All other and unclassified.....	10,736	11,890	718
Total.....	858,168	651,020	177,714
West Indies to Balboa, C. Z.:			
Mineral oils.....	234,205	786,400	65,307
All other and unclassified.....	8,733	8,954	
Total.....	242,938	795,354	65,307
West Indies to Australasia:			
Asphalt.....	26,912	14,904	3,453
Mineral oils.....	43,432	277,172	
All other and unclassified.....	1,814	23,187	18,489
Total.....	72,188	315,353	21,942
West Indies to Asia (excluding Philippine Islands):			
Mineral oils.....	25,586		
All other and unclassified.....	7,003		19,892
Total.....	32,589		19,892
West Indies to Hawaiian Islands:			
Mineral oils.....	43,719		
All other and unclassified.....		4,680	
Total.....	43,719	4,680	
Europe to West Coast United States:			
Cresote.....	23,764		21,094
Iron and steel manufactures.....	935	9	44,164
Paper and paper products.....	16,657		44,558
All other and unclassified.....	39,724	18,052	227,585
Total.....	81,080	18,061	337,401

IMPORTANT COMMODITY SHIPMENTS OVER PRINCIPAL TRADE ROUTES—Continued

ATLANTIC TO PACIFIC—Continued

[Tons of 2,240 pounds]

	Fiscal year		
	1947	1946	1939
Europe to west coast Canada:			
Cement.....	10, 232	42	859
Salt.....	11, 200		633
All other and unclassified.....	26, 136	4, 020	77, 297
Total.....	47, 568	4, 062	78, 789
Europe to west coast Central America/Mexico:			
Cement.....	21, 015	1, 000	48, 691
All other and unclassified.....	1, 999	1, 258	43, 182
Total.....	23, 014	2, 258	91, 873
Europe to west coast South America:			
Cement.....	31, 230	3, 461	54, 377
Iron and steel manufactures.....	35, 720	8, 997	72, 989
Paper and paper products.....	33, 402	9, 382	3, 773
Woodpulp.....	28, 719	10, 114	15, 289
All other and unclassified.....	87, 139	56, 697	269, 269
Total.....	216, 210	88, 651	415, 697
Europe to Australasia:			
Automobiles and parts.....	17, 845	4, 446	34, 282
Iron and steel manufactures.....	28, 890	10, 621	101, 345
Machinery.....	13, 313	7, 408	26, 060
Salt.....	25, 321	5, 633	31, 149
Slag.....	12, 120		26, 495
Textiles.....	22, 147	6, 577	22, 227
All other and unclassified.....	120, 199	172, 492	301, 212
Total.....	239, 835	207, 177	542, 770
Europe to Balboa, C. Z.:			
Cement.....	24, 076	3, 346	10, 714
All other and unclassified.....	2, 296		1, 773
Total.....	26, 372	3, 346	12, 487

PACIFIC TO ATLANTIC

West coast United States to east coast United States:			
Asphalt.....		11	64, 113
Beans.....	1, 801	1, 357	68, 922
Canned food products.....	226, 313	104, 934	735, 122
Flour, wheat.....	20, 030	28, 652	115, 597
Fruit, dried.....	10, 046	4, 113	157, 016
Iron and steel manufactures.....	58, 031	15, 963	6, 218
Lumber.....	661, 170	260, 260	1, 521, 200
Metal:			
Copper.....	168	896	45, 948
Lead.....	12, 567	15	17, 912
Mineral oils.....	148, 980	110, 374	810, 051
Molasses.....	27, 708	14	195
Ore, magnesite.....	39, 077	23, 114	8, 683
Paper and paper products.....	16, 600	10, 795	81, 382
Rice.....	10, 537	3, 401	4, 886
Sugar.....	13, 048	6, 180	140, 044
Wheat.....	17, 150	77, 654	1, 117
Wood pulp.....	22, 454	18, 297	188, 777
All other and unclassified.....	177, 749	121, 394	526, 020
Total.....	1, 463, 429	787, 424	4, 493, 203
West coast United States to east coast South America:			
Lumber.....	15, 351	1, 889	21, 623
Iron and steel manufactures.....	60, 207	10, 479	55
All other and unclassified.....	75, 142	52, 178	23, 544
Total.....	150, 700	64, 546	45, 222

IMPORTANT COMMODITY SHIPMENTS OVER PRINCIPAL TRADE ROUTES—Continued

PACIFIC TO ATLANTIC—Continued

[Tons of 2,240 pounds]

	Fiscal year		
	1947	1946	1939
West coast United States to Cristobal, C. Z.:			
Mineral oils.....	7		32,955
All other and unclassified.....	4,857	2,825	22,118
Total.....	4,864	2,825	55,073
West coast United States to West Indies:			
Canned food products.....	38,818	19,523	13,045
Iron and steel manufactures.....	11,883	2,565	83
Mineral oils.....	162	183	401,358
Rice.....	71,759	19,353	17,308
All other and unclassified.....	49,264	41,616	55,395
Total.....	171,886	83,240	487,189
West coast United States to Europe:			
Asphalt.....	32,470	9,287	1,282
Barley.....	7,134	10,694	136,713
Borax.....	30,552	9,138	66,598
Canned food products.....	201,144	218,788	225,723
Coal.....	333,397	180,724	149
Coconut oil.....	17,114	8,381	
Coke.....	77,203	44,081	38
Cotton, raw.....	17,047	132	17,647
Flour, wheat.....	24,222	25,221	8,314
Fruit, dried.....	93,638	50,412	161,102
Fruit, fresh.....	45,523	16,231	319,176
Grains, other than classified.....	2,544	43,303	1,650
Groceries.....	21,852	19,149	183
Iron and steel manufactures.....	173,968	67,555	113
Lumber.....	315,357	429,389	159,535
Machinery.....	11,535	184	609
Metals:			
Copper.....	18,100	122	19,014
Other and unclassified.....	78,054	77,928	3,932
Mineral oils.....	986	9,313	605,776
Sugar.....	18,326	30,406	
Wheat.....	172,477	266,917	528,454
Wood pulp.....	22,716	8,551	22,478
All other and unclassified.....	126,084	124,820	71,402
Total.....	1,841,143	1,650,726	2,349,888
West coast United States to Africa:			
Lumber.....	70,198	12,380	33,762
Wheat.....		11,652	
All other and unclassified.....	30,356	12,018	11,097
Total.....	100,554	36,050	44,859
West coast Canada to east coast United States:			
Iron ore.....	24,994		
Lumber.....			167,856
All other and unclassified.....	31		33,763
Total.....	25,025		201,619
West coast Canada to east coast Canada:			
Lumber.....		3,366	48,724
All other and unclassified.....			7,674
Total.....		3,366	56,398
West coast Canada to West Indies:			
Lumber.....	21,479	3,961	23,969
All other and unclassified.....	4,194	1,105	7,602
Total.....	25,673	5,066	31,571

IMPORTANT COMMODITY SHIPMENTS OVER PRINCIPAL TRADE ROUTES—Continued

PACIFIC TO ATLANTIC—Continued

[Tons of 2,240 pounds]

	Fiscal year		
	1947	1946	1939
West coast Canada to east coast South America. (No single outstanding commodity in this trade.)			
West coast Canada to Europe:			
Ammonium compounds.....	24,857	11,338	-----
Canned food products.....	51,806	50,905	26,269
Fertilizers, unclassified.....	32,615	14,313	-----
Flour, wheat.....	57,021	3,900	7,722
Fruit, fresh.....	23,992	13,576	32,350
Grains, other than oats and wheat.....	21,398	46,939	59,657
Lumber.....	978,113	449,566	1,136,276
Metals:			
Lead.....	7,676	40,910	117,875
Zinc.....	41,376	16,907	67,827
Oats.....	75,468	4,618	49,888
Wheat.....	1,281,104	825,806	972,584
All other and unclassified.....	42,660	49,217	68,988
Total.....	2,638,086	1,527,995	2,539,436
West coast Canada to Asia:			
Lumber.....	26,159	-----	-----
All other and unclassified.....	2,500	-----	385
Total.....	28,659	-----	385
West coast Canada to Africa:			
Lumber.....	201,424	66,735	21,283
Wheat.....	-----	118,239	-----
All other and unclassified.....	22,605	16,278	5,627
Total.....	224,029	201,252	26,910
West coast Central America/Mexico to east coast United States:			
Bananas.....	268,891	234,335	25,801
Ore manganese.....	25,543	12,053	-----
All other and unclassified.....	14,060	10,099	4,848
Total.....	308,494	256,487	30,649
West coast Central America/Mexico to Cristobal, C. Z.:			
Coffee.....	45,746	14,968	31,999
Lumber.....	13,209	5,020	4,336
All other and unclassified.....	12,782	11,454	7,137
Total.....	71,737	31,442	43,472
West coast Central America/Mexico to Europe:			
Bananas.....	25,661	9,071	50
Coffee.....	1,860	3,857	24,777
All other and unclassified.....	542	-----	23,289
Total.....	28,063	12,928	48,116
West coast South America to east coast United States:			
Bananas.....	31,021	1,567	18,806
Cocoa.....	11,692	4,782	5,181
Coffee.....	136,830	108,288	24,242
Cotton, raw.....	10,228	8,568	6,060
Metal:			
Copper.....	138,368	119,366	82,959
All other and unclassified.....	27,987	22,394	6,242
Molasses.....	14,908	13,937	7,396
Nitrate of soda.....	379,164	490,097	546,352
Ore:			
Copper.....	53,494	138,670	15,169
Iron.....	1,585,131	588,585	1,612,801
Manganese.....	113,584	130,193	191
Tin.....	35,218	50,515	380
Zinc.....	79,641	131,360	18,089
Other and unclassified.....	5,010	19,745	25,347
Sugar.....	25,221	50,113	42,117
All other and unclassified.....	53,364	119,635	33,925
Total.....	2,700,861	1,997,815	2,447,257

IMPORTANT COMMODITY SHIPMENTS OVER PRINCIPAL TRADE ROUTES— Continued

PACIFIC TO ATLANTIC

[Tons of 2,240 pounds]

	Fiscal year		
	1947	1946	1939
West coast South America to east coast Canada:			
Mineral oils.....	8,423	15,540	126,461
All other and unclassified.....		1,531	5,903
Total.....	8,423	17,071	132,364
West coast South America to east coast South America:			
Rice.....	12,618	7,565	199
Sugar.....	10,880	9,078	166
All other and unclassified.....	19,995	24,942	12,099
Total.....	43,483	41,585	12,464
West coast South America to Cristobal, C. Z.:			
Coffee.....	18,641	9,281	93,785
All other and unclassified.....	24,018	24,317	49,401
Total.....	42,659	33,598	143,186
West coast South America to West Indies:			
Beans.....	13,068	10,280	8,923
Mineral oils.....			79,249
Nitrate of soda.....	34,764	21,136	447
Rice.....	25,710	16,322	
All other and unclassified.....	12,914	12,114	15,284
Total.....	86,456	59,852	103,903
West coast South America to Europe:			
Barley.....	1,067	2,537	55,329
Beans, dried.....	12,683	8,916	52,663
Cotton, raw.....	37,566	51,275	65,115
Metal:			
Copper.....	174,970	59,570	235,363
Lead.....	16,672	11,177	28,726
Mineral oils.....	68,010	44,927	679,000
Nitrate of soda.....	597,518	667,960	864,384
Oilseeds.....	856		65,013
Ore:			
Copper.....	3,849	15,568	21,813
Lead.....	1,290		43,823
Tin.....	18,312	18,893	42,492
Zinc.....	15,376	9,516	28,073
Other and unclassified.....	11,531	21,305	29,899
Rice.....	11,878	1,759	821
Sugar.....	40,925	15,860	132,563
All other and unclassified.....	85,182	41,192	136,464
Total.....	1,097,688	970,455	2,481,541
West coast South America to Africa:			
Nitrate of soda.....	260,765	131,658	24,180
All other and unclassified.....	2,641		
Total.....	263,406	131,658	24,180
Hawaiian Islands to east coast United States:			
Canned fruit.....	125,787	65,204	129,683
Molasses.....	15,057		14,616
Sugar.....	16,070	30,173	208,208
All other and unclassified.....	44,689	6,446	9,350
Total.....	201,603	101,823	361,857
Hawaiian Islands to east coast Canada. (No single outstanding commodity in this trade.)			
Hawaiian Islands to Europe:			
Molasses.....			79,174
All other and unclassified.....	11,236		
Total.....	11,236		79,174

IMPORTANT COMMODITY SHIPMENTS OVER PRINCIPAL TRADE ROUTES— Continued

PACIFIC TO ATLANTIC

[Tons of 2,240 pounds]

	Fiscal year		
	1947	1946	1939
Australasia to east coast United States:			
Ore:			
Chrome.....	8,050	31,077	8,744
Manganese.....			24,518
All other and unclassified.....	720	35,984	7,019
Sand.....	26,168	10,338	1,076
Skins and hides.....	23,109	18,472	16,540
Wheat.....	63	21,565	
Wool.....	115,774	59,206	13,375
All other and unclassified.....	22,748	61,037	15,727
Total.....	196,632	237,679	86,999
Australasia to east coast Canada:			
Fruit, dried.....	10,480	7,157	11,485
Metal, scrap.....	21,564		
Sugar.....			63,816
Wool.....	19,197	13,317	5,074
All other and unclassified.....	14,491	11,471	7,171
Total.....	65,732	31,945	87,546
Australasia to Europe:			
Canned food products.....	30,142	2,345	4,681
Copra.....	58,975	4,310	82,147
Dairy products, refrigerated.....	183,937	60,287	145,913
Meat, refrigerated.....	306,446	192,991	168,720
Metal:			
Lead.....	17,844	11,346	13,078
Other and unclassified.....	13,107	4,043	2,143
Ore:			
Chrome.....	10,064	13,000	5,500
Zinc.....	29,937	13,897	16,526
Other and unclassified.....	12,694	10,932	16,525
Phosphates.....	35		87,160
Skins and hides.....	13,782	3,074	7,321
Sugar.....	17,547		83,079
Tallow.....	21,578	8,616	16,157
Wheat.....		28,644	5,326
Wool.....	130,132	13,303	68,886
All other and unclassified.....	61,444	91,024	36,632
Total.....	907,664	457,812	759,794
Philippine Islands to east coast United States:			
Coconut oil.....	3,574		106,680
Copra.....	223,323		65,531
Hemp, unmanufactured.....	33,739	11,842	15,588
Ore:			
Chrome.....	64,258	6,000	18,650
Other and unclassified.....	11,960		8,000
Sugar.....			579,691
All other and unclassified.....	19,341	13,414	124,797
Total.....	356,195	31,256	918,937
Asia (excluding Philippine Islands) to east coast United States:			
Fish meal.....			22,856
Metal:			
Lead.....	16,056		105
Zinc.....	11,735		46
Oils, vegetable.....	25,202	10	27,306
Ores, various.....	15,680		6,198
Rubber, crude.....	33,471	17,769	20,615
Silk, raw.....	1,428	79	20,131
All other and unclassified.....	52,594	2,224	183,335
Total.....	156,166	20,082	280,593
Asia (excluding Philippine Islands) to Europe:			
Canned fish.....			50,364
Soya beans.....			224,621
All other and unclassified.....	2,922		88,063
Total.....	2,922		363,048

OCEAN PASSENGER TRAFFIC

The following tabulation shows by month the number of ocean passengers, exclusive of transients, disembarking and embarking at Canal Zone ports during the fiscal year 1947, segregated between first-class and all others, with comparative totals for the fiscal years 1946 and 1939:

	Passengers disembarking			Passengers embarking		
	First class	Others	Total	First class	Others	Total
July.....	647	44	691	736	322	1,058
August.....	926	75	1,001	490	293	783
September.....	895	48	943	625	626	1,251
October.....	486	206	692	696	576	1,272
November.....	702	15	717	730	366	1,096
December.....	576	21	597	521	245	766
January.....	970	18	988	605	244	849
February.....	742	27	769	462	22	484
March.....	819	76	895	873	73	946
April.....	691	289	980	1,204	601	1,805
May.....	707	35	742	1,126	113	1,239
June.....	986	5	991	998	23	1,021
Total, 1947.....	9,147	859	10,006	9,066	3,504	12,570
Total, 1946.....	5,726	422	6,148	5,193	1,576	6,769
Total, 1939.....	19,073	16,368	35,441	18,833	16,609	35,442

The following table shows the passenger traffic through the ports of Cristobal and Balboa during the fiscal years 1947, 1946, and 1939:

	Port of Cristobal			Port of Balboa		
	1947	1946	1939	1947	1946	1939
Passengers disembarking.....	9,295	4,210	26,799	711	1,938	8,642
Passengers embarking.....	8,799	4,597	26,448	3,771	2,172	8,994

A further segregation of the passenger movement for 1947 shows that 8,995 incoming and 8,573 outgoing passengers came from or were destined to ports of the Atlantic, and 1,011 incoming and 3,997 outgoing passengers were brought from or were destined to ports of the Pacific.

TRANSIENT PASSENGERS

In addition to the figures shown above of passengers disembarking and embarking, there were 29,685 transient passengers brought to the Isthmus by vessels calling at Canal ports during the fiscal year 1947. For the fiscal year 1946 there were 28,805, and in the prewar year of 1939 the number was 114,053; the latter figure is almost four times greater than the number recorded for 1947.

The origin and destination of these transient passengers are indicated in the following tabulation:

	Fiscal year		
	1947	1946	1939
Remaining on board vessels transiting Canal:			
Atlantic to Pacific.....	15,694	6,744	48,058
Pacific to Atlantic.....	13,019	21,328	30,750
Remaining on board vessels entering port but not transiting Canal:			
Atlantic to Atlantic.....	868	659	33,996
Pacific to Pacific.....	104	74	1,249
Total.....	29,685	28,805	114,053

Prior to the outbreak of the recent war, a great number of passengers visited the Canal Zone as members of special tourist cruises, but these cruises have been inactive since 1939. The bulk of this traffic was on vessels calling at Cristobal which did not transit the Canal and is reflected in the Atlantic to Atlantic movement in the table above. Some resumption of the passenger services operated before the war has been effected since the cessation of hostilities but, as will be noted from the above table, the movement from one ocean to the other is still far below the 1939 level.

The lack of passenger vessels has been partly responsible for the relatively light movement of passengers in 1947, but it is also true that travel by air has cut deeply into the ship tourist business.

SMALL TOLLS-PAYING VESSELS TRANSITING CANAL

Transits of small cargo-carrying vessels and other small miscellaneous craft of less than 300 net tons (Panama Canal measurement) or 500 displacement tons (for vessels rated on displacement tonnage) are excluded from statistics on ocean-going, tolls-paying traffic, although the vessels are not exempt from the payment of tolls. Transit of these small vessels during 1947, 1946, and 1939, together with the tonnage, tolls, and amount of cargo carried, are summarized in the following table:

	Fiscal year 1947			Total fiscal year	
	Atlantic to Pacific	Pacific to Atlantic	Total	1946	1939
Number of transits:					
Rated on net tonnage.....	437	410	847	280	913
Rated on displacement tonnage.....				5	1
Total transits.....	437	410	847	285	914
Panama Canal net tonnage.....	25,934	21,646	47,580	26,594	45,557
Displacement tonnage.....				1,970	180
Tolls.....	\$19,528.02	\$18,230.76	\$37,758.78	\$22,713.16	\$38,409.94
Cargo (tons).....	3,415	12,884	16,299	19,776	31,251

VESSELS ENTITLED TO FREE TRANSIT

Vessels operated in the Government service of the United States and Republic of Panama, war vessels of the Republic of Colombia, and vessels transiting solely for the purpose of having repairs made at the Canal shops, are exempt from the payment of tolls, and such

vessels are not included in the general transit statistics pertaining to Canal traffic.

Before the outbreak of the recent war, the number of vessels making Canal transit free of tolls comprised but a relatively small part of Canal traffic (less than 9 percent in 1939). At the beginning of hostilities there was a rapid expansion of such traffic and in 1946 a total of 5,554 tolls-free vessels, or about 58 percent of total Canal transits, made Canal passage. In the past fiscal year (1947), the first full year of peace-time operation following end of hostilities, the number of vessels entitled to free transit dropped to 1,265, or about 20 percent of total transits for the year.

The following tabulation shows for the past 2 years and for the fiscal year 1939 the number of tolls-free vessels passing through the Canal, their tonnage, the approximate amount of tolls to which they would have been subject at the prescribed rates if tolls had been charged against them, and the tons of cargo carried by such vessels:

	Fiscal year 1947			Total fiscal year	
	Atlantic to Pacific	Pacific to Atlantic	Total	1946	1939
Number of transits:					
On net tonnage basis	421	449	870	3,172	246
On displacement tonnage basis	116	279	395	2,382	418
Total transits	537	728	1,265	5,554	664
Tonnage:					
Panama Canal net	1,008,703	625,962	1,634,665	12,664,743	583,237
Displacement	602,485	1,277,826	1,880,311	9,423,728	1,670,646
Approximate value of tolls	\$1,179,646	\$1,126,141	\$2,305,787	\$15,262,087	\$1,334,420
Cargo (tons)	837,448	164,160	1,001,608	7,471,446	95,265

CANAL OPERATION AND MAINTENANCE

HOURS OF OPERATION

Dispatching of ships through the Canal is conducted on schedules. Vessels awaiting transit begin moving through the Canal from the terminal ports at 6 a. m. and dispatches are made thereafter from each terminus at intervals of from $\frac{1}{2}$ to 1 hour. The following is a summary of normal arrangements in effect at the end of the fiscal year.

From Cristobal Harbor, first ship at 6 a. m., last at about 3 p. m.; from Balboa anchorage, first ship at 6 a. m., last at 3:30 p. m.

Tankers and vessels carrying hazardous cargoes are dispatched at the discretion of the port captain and normally are not permitted to proceed unless they can clear Gaillard Cut before dark.

LOCKAGES AND LOCK MAINTENANCE

OPERATING SCHEDULE OF LOCKS

There were three operating crews at all locks except during the overhaul period, when five, and for a short period four, operating

crews were in use at the Gatun Locks. The following operating schedules were in effect at the locks on June 30, 1947:

Gatun:

Shift No. 1: 7 a. m. to 3 p. m.—8 locomotives.

Shift No. 1X: 10 a. m. to 6 p. m.—8 locomotives.

Shift No. 2: 3 p. m. to 11 p. m.—8 locomotives.

Pedro Miguel:

Shift No. 1: 8 a. m. to 4 p. m.—8 locomotives.

Shift No. 2: 9:30 a. m. to 5:30 p. m.—8 locomotives.

Shift No. 3: 2 p. m. to 10 p. m.—8 locomotives.

Miraflores:

Shift No. 1: 7 a. m. to 3 p. m.—8 locomotives.

Shift No. 2: 9:30 a. m. to 5:30 p. m.—8 locomotives.

Shift No. 3: 3 p. m. to 11 p. m.—8 locomotives.

LOCKAGES

The number of lockages and vessels handled (including Panama Canal equipment) is shown in the following table, by months, for the fiscal year 1947, with corresponding totals for the previous 5 years:

Month	Gatun		Pedro Miguel		Miraflores	
	Lockages	Vessels	Lockages	Vessels	Lockages	Vessels
<i>1946</i>						
July.....	475	640	498	695	491	683
August.....	425	542	440	595	440	593
September.....	338	428	360	525	355	534
October.....	358	483	382	552	376	550
November.....	343	479	376	552	371	534
December.....	379	553	399	570	394	575
<i>1947</i>						
January.....	395	587	420	628	416	622
February.....	392	522	420	568	411	560
March.....	444	652	473	689	465	670
April.....	435	551	461	615	446	593
May.....	446	624	459	625	457	634
June.....	428	613	467	667	462	673
Total.....	4,858	6,674	5,155	7,281	5,084	7,221
<i>Fiscal year:</i>						
1942.....	4,609	10,986	4,445	8,084	3,775	5,806
1943.....	2,796	5,236	3,661	6,672	3,395	5,934
1944.....	3,267	5,846	4,036	7,632	3,656	6,424
1945.....	5,261	9,201	6,268	12,334	5,635	10,097
1946.....	6,823	9,901	7,139	10,654	7,076	10,561

Both chambers were available for service at all three locks during the year except during the period of the Atlantic Locks overhaul (described in subsequent paragraphs) extending from January 5, 1947, to April 17, 1947. From January 5 to March 4 the west chamber was out of service and all traffic was routed through the east chamber, while during the balance of the overhaul period the east chamber was out of service and traffic was transferred to the west chamber.

Total lockages for the three locks were 28 percent under the number handled in the previous year.

The average number of lockages made daily and the average number of vessels handled per lockage during each of the past five fiscal years are shown in the following tabulation:

Fiscal year	Average number of lockages per day			Average number of vessels per lockage		
	Gatun	Pedro Miguel	Miraflores	Gatun	Pedro Miguel	Miraflores
1943.....	7.7	10.0	9.3	1.87	1.82	1.75
1944.....	8.9	11.1	10.0	1.79	1.89	1.76
1945.....	14.4	17.1	15.4	1.74	1.96	1.79
1946.....	18.7	19.5	19.4	1.45	1.49	1.49
1947.....	13.3	14.1	13.9	1.37	1.41	1.42

DELAYS TO SHIPPING

The lock operating machinery functioned smoothly throughout the year except for a few incidents due to faulty operation or minor failures of equipment. The following summary includes all delays to vessels while transiting the locks due to the incidents mentioned:

	Number of lockages delayed	Aggregate delay caused all vessels
Gatun.....	22	<i>Hr. M.</i> 4 59
Pedro Miguel.....	12	2 24
Miraflores.....	28	6 8
Total.....	62	13 31

MAINTENANCE

Regular inspection and maintenance were continued for all locks' machinery and equipment. Routine tests and inspections were regularly carried out with a view to detecting weak points and potential failures before break-downs occurred. Where inspection and tests indicated that a mechanical or electrical part or device was in need of replacement or repair, such replacement or repair was made by the operation and maintenance forces of the locks.

The study of the modernization of the locks electrical system, begun during fiscal year 1946, was continued. A study of the modernization of towing locomotives was begun during the year. A project for manufacturing six new towing locomotives has been approved and the Mechanical Division is proceeding with the work.

ATLANTIC LOCKS OVERHAUL

The overhaul of the Atlantic locks during the past fiscal year was the first complete overhaul to be performed on any of the locks since 1939. The work was begun on January 6, 1947, and was completed so that both sides were in service on April 17, the total elapsed time being 101 days and the actual working time 85 days. The work was performed on a two-shift basis, except for the rebearing work on miter gates which was on a three-shift basis. Work was on a 6-day-a-week, 40-hour week basis, with the exception of overtime authorized on the miter gates and special protective works in order to coordinate this work with the general overhaul.

The extra gold force employed for the overhaul totaled 235 employees, of whom 45 were brought from the United States and the remaining 190 were borrowed from other divisions, transferred temporarily from the Pacific locks, or employed locally. The extra silver force necessary varied with the requirements, a maximum of 925 being employed at one time.

During the overhaul period the Atlantic locks were operated on a 24-hour basis to accommodate shipping and to prevent undue delay to transiting vessels. A brief résumé of the work performed is given below.

Eight miter-gate leaves were raised and rolled out for the renewal of all bearing plates, pintles, pintle bushings, yoke bushings and pins. This was the first time since 1935 that gates have been removed for rebearing work at the Atlantic locks.

The 56 rising stem and 6 guard valves were removed, and were replaced with 36 valves after being repaired and 26 spare valves. The usual replacements were made of side and top seals, roller-train track liners on valves and in pits, and front wearing pads. Some new wall tracks were installed due to excessive corrosion. New roller trains were made up and installed as required, using 160 new guide bars and 3,500 bronze rollers. Six new valve stems were installed.

Horizontal seals, hydraulic buffers, and split trombone extensions were installed on the east emergency gate to complete the work omitted during construction. Both gates were placed on support beams for inspection, painting, and other miscellaneous work.

Pipe was imbedded from the east and west side wall culverts to the chamber near the north caisson seats. This will permit pumping directly from the side wall culverts and eliminate the long run of suction pipe to the first side-wall lateral culvert.

Bitumastic solution and enamel were applied to miter gates, rising stem valves, cylindrical valves, bulkheads, screens and other miscellaneous steel parts.

POWER FOR CANAL OPERATION

The table below summarizes and gives pertinent data relative to the electric power generated by the power system of the Canal Zone for the past three fiscal years:

	Fiscal year		
	1947	1946	1945
Gross power generated:			
Gatun hydro station	88, 577, 400	87, 516, 900	91, 683, 100
Madden hydro station	151, 581, 000	159, 120, 700	165, 419, 800
Diesel stations	10, 611, 600	13, 500, 500	12, 776, 700
Total generated	250, 770, 000	260, 138, 100	269, 879, 600
Consumed in station service	2, 478, 571	2, 645, 088	3, 106, 023
Net generator output	248, 291, 429	257, 493, 012	266, 773, 577
Distributed to consumers	222, 126, 106	226, 810, 535	236, 318, 174
Transmission loss:			
Kilowatt-hours	26, 165, 323	30, 682, 477	30, 455, 403
Percent	10.54	11.92	11.41
Peak load—kilowatts	46, 500	50, 400	47, 300
Date	(1)	(2)	(3)

¹ Feb. 14, 1947.

² Oct. 3, 1945.

³ Feb. 9, 1945.

The No. 5 and No. 6 generating units in the Gatun hydroelectric station were put into regular service in October 1946 and April 1947, respectively.

Units Nos. 1 and 2 at the Madden hydroelectric station were shut down, dismantled, and completely overhauled during the year. New turbine runners were installed, all wearing surfaces and bushings replaced or resurfaced, and the units restored to substantially new condition.

The operation of the No. 3 unit at the Miraflores Diesel-electric station, which was assembled during the fiscal year 1946 continued to be unsatisfactory. The unit is receiving careful study and there are indications that it can ultimately be made to operate reliably.

During the year service was temporarily interrupted at various substations on seven different occasions. There were 27 transmission line failures during the year, of which 8 were caused by lightning flash-over, 9 by animal contact, 2 by kites and wires on the line, 2 by control or relay malfunction, 1 by mechanical failure of insulator, 1 by operating error, and 4 by unknown causes.

WATER SUPPLY AND GENERAL WEATHER CONDITIONS

WATER SUPPLY

The water requirements of The Panama Canal for hydroelectric power, lockages, and municipal use are supplied by Madden and Gatun Lakes which together drain an area of 1,289 square miles. All outflow from Madden Lake, whether spilled at Madden Dam or drawn for use of the Madden hydroelectric station, flows into Gatun Lake and, together with the direct inflow from the area downstream from Madden Dam, is available for Gatun Lake uses. The total

flow into Madden and Gatun Lakes during the year ended June 30, 1947, amounted to 168,824 million cubic feet, which is 19 percent below the average inflow for the 33 years since the formation of Gatun Lake. Evaporation losses from Madden and Gatun Lakes totaled 23,645 million cubic feet, leaving 145,179 million cubic feet available for use. The source and expenditure of this water, together with comparable data for the preceding year, are itemized in the following tabulation:

	Million cubic feet, year ended June 30		Percent of available water supply, year ended June 30	
	1947	1946	1947	1946
MADDEN AND GATUN LAKE WATER SUPPLY				
Direct flow into Madden Lake.....	78,787	81,751		
Evaporation from Madden Lake.....	2,395	2,432		
Available for Madden Lake uses.....	76,392	79,319		
Direct inflow into Gatun Lake.....	90,037	111,848		
Subtotal.....	166,429	191,167		
Evaporation from Gatun Lake.....	21,250	21,087		
Available for Gatun Lake uses.....	145,179	170,080		
MADDEN LAKE WATER EXPENDITURES				
Madden hydroelectric power.....	63,243	65,968	82.8	83.2
Madden spillway discharge.....	14,720	12,832	19.3	16.2
Change in Madden Lake storage.....	-1,571	+519	-2.1	+1.6
Total Madden Lake expenditures.....	76,392	79,319	100.0	100.0
GATUN LAKE WATER EXPENDITURES				
Gatun hydroelectric power.....	65,648	62,340	45.2	36.6
Gatun and Pedro Miguel lockages.....	36,817	52,000	25.4	30.6
Municipal and other uses.....	3,108	3,249	2.1	1.9
Subtotal Gatun Lake uses.....	105,573	117,589	72.7	69.1
Gatun spillway discharge.....	35,967	54,589	24.8	32.1
Change in Madden and Gatun Lake storage.....	+3,639	-2,098	+2.5	-1.2
Total Gatun Lake expenditures.....	145,179	170,080	100.0	100.0

Storms and floods.—No storms occurred during the year with wind velocities high enough to cause any material damage to Canal structures. There were no rains of sufficient extent and duration to produce flood conditions of any great magnitude on Madden and Gatun Lakes. The only approach to a general flood occurred on December 9, 1946, but the heavy rains did not extend downstream from Madden Dam and continued for only about 1 day. Madden Dam drum gates were lowered to elevation 246 feet, with the maximum discharge of the year down the Chagres River channel at Alhajuela of 47,920 cubic feet per second. The maximum discharge at Gatun spillway during the year was 94,648 cubic feet per second on November 30, 1946.

Dry season, 1947.—The 1947 dry season was somewhat longer and dryer than usual, with dry season weather lasting from about the middle of December to the middle of May. The total inflow into

Madden and Gatun Lakes during the 4-month period, January to April inclusive, was 22 percent below the 34-year average for the same period. The period during which the flow into Madden and Gatun Lakes was insufficient to provide water for evaporation losses from lake surfaces and for Panama Canal uses extended from December 31, 1946, to May 20, 1947, a total of 141 days. The total inflow into Madden and Gatun Lakes during this 141-day period was 18,612 million cubic feet. Water expenditures for the same period amounted to 49,206 million cubic feet, consisting of 11,718 million cubic feet evaporation loss from lake surfaces, and Gatun Lake water use of 37,488 million cubic feet. The dry-season draft on lake storage amounted to 30,594 million cubic feet, of which 14,373 million cubic feet were drawn from Madden Lake and 16,221 million cubic feet from Gatun Lake.

Lake elevations.—During the fiscal year ended June 30, 1947, Madden Lake varied in elevation between a maximum of 255.09 feet on December 9, 1946, and a minimum of 217.22 feet on June 3, 1947, a total range of 37.87 feet. Gatun Lake varied in elevation between a maximum of 87.21 feet on November 30, 1946, and a minimum of 83.23 feet on April 28, 1947, a total range of 3.98 feet. Elevations on June 30, 1947, were 222.74 feet for Madden Lake and 83.77 feet for Gatun Lake.

Rainfall.—During the fiscal year ended June 30, 1947, the rainfall in the Canal Zone was considerably below normal along the Pacific coast and in the interior, and close to normal or slightly above near the Atlantic coast. Along the line of the Canal channel, annual totals ranged from a minimum of 55.46 inches at Balboa near the Pacific terminal to a maximum of 133.13 inches at Cristobal near the Atlantic terminal. The month of maximum rainfall varied from July to December, depending upon the location. The maximum monthly amount recorded during the year was 26.71 inches at Cristobal in December 1946. The month of least rainfall was March 1947, with monthly totals ranging from no measurable amounts at several stations to 1.49 inches at Monte Lirio.

AIR TEMPERATURES

Air temperatures in the Canal Zone during the fiscal year averaged a fraction of a degree above normal. There was little variation in temperature throughout the year, no monthly mean at any station departing more than 2.4° F. from the annual mean. Annual means and extremes at Canal Zone stations for the fiscal year are given in the following tabulation:

Station	1947 maximum		1947 minimum		1947 mean (°F.)	Departure (°F.)
	°F.	Date	°F.	Date		
Balboa Heights.....	96	Apr. 15, 1947	69	Aug. 22, 1946	79.6	+0.8
Madden Dam.....	96	Feb. 20, 1947	65	Jan. 6, 1947	78.2	+0.6
Cristobal.....	90	Oct. 4, 1946	70	Feb. 16, 1947	79.8	-0.3

Annual extremes and means on record at the above stations are as follows:

Station	Absolute maximum		Absolute minimum		Annual mean (°F.)
	°F.	Date	°F.	Date	
Balboa Heights.....	97	Apr. 28, 1946	63	Jan. 27, 1910	78.8
Madden Dam.....	98	Apr. 13, 1920	59	Feb. 4, 1924	77.6
Cristobal.....	95	Oct. 18, 1924 May 21, 1925	66	Jan. 30, 1909 Dec. 3, 1909	80.1

WINDS AND HUMIDITY

Wind velocities for the fiscal year averaged 7 miles per hour at Balboa Heights on the Pacific coast and 10 miles per hour at Cristobal on the Atlantic coast. Monthly mean velocities at Balboa Heights ranged from 4 miles per hour in June to 10 miles per hour in March. Monthly mean velocities at Cristobal ranged from 6 miles per hour in June to 14 miles per hour in April. The most frequent directions were northwest along the Pacific coast and northeast along the Atlantic coast. Maximum velocities for 5-minute periods were 26 miles per hour from the south on December 15, 1946, at Balboa Heights and 26 miles per hour from the north on February 15, 1947, at Cristobal.

The relative humidity averaged 84 percent at both Balboa Heights and Cristobal. Monthly means at Balboa Heights ranged from 76 percent in March to 90 percent in September, and at Cristobal, from 80 percent in January to 88 percent in June.

TIDES

During the fiscal year ended June 30, 1947, absolute tidal ranges at Canal terminals were 20.7 feet on the Pacific coast and 2.4 feet on the Atlantic coast. At Balboa, the Pacific terminal of the Canal, the following extremes occurred: Highest high water 9.9 feet above mean sea level, lowest low water 10.8 feet below mean sea level, with the greatest range between consecutive tides 20.2 feet. At Cristobal, the Atlantic terminal of the Canal, the following extremes occurred: Highest high water 1.66 feet above mean sea level, lowest low water 0.80 foot below mean sea level, with the greatest range between consecutive tides 2.08 feet.

SEISMOLOGY

Three earthquake shocks were felt by Canal Zone residents during the fiscal year ended June 30, 1947. The seismograph records indicated that the epicenters of all three shocks were at a distance of 40 to 50 miles from Balboa Heights. All were light and caused no damage in the Canal Zone area. The most intense shock occurred on July 12, 1946, at 3:05 p. m., 75th meridian time. It was rated

intensity III on the Modified Mercalli Scale. The other two occurred on October 19, 1946, at 2:47 p. m., and December 10, 1946, at 11:13 p. m., respectively, and were rated at intensity I.

MARINE ACTIVITIES

Marine activities were at a reduced level in the fiscal year 1947 by reason of a 33.5 percent decrease in traffic in comparison with the previous fiscal year. This is more fully discussed earlier in this report under "Statistics on Canal Traffic."

Following the settlement of a threatened maritime strike in the United States in June 1946, a large number of ships were dispatched to the Canal within a short period of time, resulting in an abnormally heavy concentration of vessels at the Canal terminals during the early part of the fiscal year. During the period July 4-7, 1946, 93 vessels arrived for transit, in addition to 13 Government craft. On July 4, 23 ships arrived for transit at Cristobal alone. Probably through a misunderstanding, the delay which naturally ensued in dispatching some of these vessels through the Canal was the subject of protest on the part of some steamship operators. It was erroneously reported from one source that the Canal would not transit ships on Saturdays and Sundays.

HARBOR ACTIVITIES

The table following shows the number of vessels handled at docks of the terminal ports of Cristobal and Balboa for the fiscal year 1947 as compared with the two previous years:

	Cristobal fiscal year			Balboa fiscal year		
	1947	1946	1945	1947	1946	1945
Number of vessels docked:						
Handling passengers and/or cargo.....	1,090	1,149	1,221	516	513	801
For all other purposes.....	1,244	3,172	2,814	651	2,058	2,183
Total.....	2,334	4,321	4,035	1,167	2,571	2,984

AIDS TO NAVIGATION

On June 30, 1947, there were 747 aids to navigation in service in the Panama Canal and its approaches, maintained by the Aids to Navigation Subdivision and classified as follows: Acetylene gas-operated, 109; electrically operated, 340; unlighted, 298. Included in the above are two automatic acetylene gas-operated lighthouses, located at Morro Puerco and at Jicarita Island on the coast of Panama in the Pacific approach. Two visits were made to these lighthouses during the year for the purpose of inspecting and servicing the equipment.

ACCIDENTS TO SHIPPING

The board of local inspectors investigated and reported on 16 accidents to shipping in Canal Zone waters during the fiscal year 1947, a summary of which follows together with a comparison of accidents in the two previous years:

Cause of accident	Fiscal year		
	1947	1946	1945
Collision.....	4	11	13
Ship struck lock wall.....	6	7	13
Ship struck dock.....	1	4	6
Ship grounded.....		3	
Ship damaged by tug.....	1		2
Ship struck Canal bank.....	1	2	3
Other causes.....	3	7	13
Total.....	16	34	50

INSPECTIONS

Complete inspections were made of the hulls, power plant, and equipment of 28 American and 20 foreign vessels and certificates of seaworthiness issued. Fifty-three hulls of commercial, Panama Canal, and Panama Railroad vessels were inspected in drydock. Thirty-eight steam boilers were inspected and certificates issued. Ninety-two air tanks and 20 CO₂ fire-extinguishing systems were inspected. Annual inspections were made and pertinent certificates issued to 172 motor boats.

ADMEASUREMENT

Admeasurement activities during the fiscal year 1947, as in the fiscal year 1946, were characterized by a heavy work load due to the arrival of many newly constructed vessels and the remeasurement of many vessels necessitated by their reconversion from war to peacetime purposes.

SALVAGE AND TOWING

During the fiscal year 1947 the following off-shore work was performed by the marine division tugs for private interests:

On July 8-9, 1946, the tug *Tavernilla* assisted to the port of Cristobal the S. S. *Frontenac* which had become disabled at sea; on March 27, 1947, the *Tavernilla* made a short trip to sea to assist to Cristobal the disabled S. S. *Esso Montpelier*. The tug *Gorgona* was dispatched to the assistance of S. S. *Urraca*, July 16-21, 1946, and the M. S. *Mashuk*, August 29-30, 1946. The tug *Favorite* was dispatched to the assistance of the S. S. *Vianna* February 24-25, 1947, and the S. S. *Royal Oak*, February 28-March 16, 1947.

The tug *Favorite* was used in the following towing operations: Towing of 4 barges from Balboa to Buenaventura, Colombia, Sep-

tember 8-12, 1946; towing of two barges from Cristobal to Puerto Cabezas, Nicaragua, September 12-20, 1946; towing of two barges (two launches on deck) from Cristobal to Barranquilla, Colombia, September 26-30, 1946. The *Favorite* left Balboa on December 3, 1946, with material destined for Masachapa, Nicaragua, and assisted in the installation of an off-shore pipe line at that point, returning to the Isthmus on December 23, 1946.

The tug *Tavernilla* towed a houseboat and tug from Cristobal to Barranquilla, Colombia, September 26-30, 1946.

OPERATION OF TUGS

Two tugs, the *Limon* and *Taboga*, acquired from the United States Navy, were delivered at Cristobal on March 25, 1947, and will be placed in service of the marine division early in the fiscal year 1948. The *Limon* will be used as a harbor tug, replacing the U. S. *Tavernilla* which has been in service since 1907. The *Taboga* will serve as a lighthouse tender, off-shore towboat and as a rescue and limited salvage vessel, replacing the U. S. S. *Favorite* which has rendered for almost 40 years excellent service in tending lights and buoys and in off-shore towing and salvage operations.

The following statistics summarize the service of tugs used in marine activities (as distinct from dredging) during the past three fiscal years:

	Operating hours, fiscal year			Jobs handled, fiscal year		
	1947	1946	1945	1947	1946	1945
Cristobal.....	5,708	10,665	12,816	4,788	3,836	9,325
Balboa.....	4,213	15,649	19,819	2,486	6,720	8,791
Total.....	9,921	26,314	32,635	7,274	10,556	18,116

The above table does not include statistics for tugs which were occasionally borrowed from dredging service to assist vessels during emergencies. It does include dredging service tugs rented over periods of time and operated under orders of the Marine Division.

MAINTENANCE OF CHANNEL—OTHER DREDGING ACTIVITIES

Dredges were operated throughout the year on the maintenance of the Canal channel, terminal harbors, and on various special projects. In 1947 the total material excavated amounted to 9,684,800 cubic yards, which was 31 percent less than the amount removed in the previous fiscal year.

Excavation during the year is summarized in the following table:

Location	Earth	Rock	Total
Canal prism dredging:	<i>Cubic yards</i>	<i>Cubic yards</i>	<i>Cubic yards</i>
Atlantic entrance, maintenance.....	205,300	0	205,300
Gatun Lake, maintenance.....	293,900	0	293,900
Gaillard Cut, maintenance, including slides.....	306,600	52,000	358,600
Gaillard Cut, project No. 13.....	160,700	251,100	411,800
Pacific entrance, maintenance.....	37,000	0	37,000
Pacific entrance, project No. 1-B.....	17,000	0	17,000
Total, Canal prism.....	1,020,500	303,100	1,323,600
Auxiliary dredging:			
Cristobal Harbor:			
Outer harbor, west anchorage.....	2,234,500	0	2,234,500
Harbor approach channel.....	1,961,700	185,500	2,147,200
Inner harbor, maintenance.....	133,500	0	133,500
Colon fill.....	1,867,800	676,800	2,544,600
Colon Corridor road fill.....	476,800	410,000	886,800
Silver City fill.....	21,600	88,000	109,600
Deep drilling and blasting test, New Gatun Locks bypass channel, north approach.....	2,700	10,300	13,000
Balboa harbor, maintenance.....	4,000	1,000	5,000
Balboa harbor, project No. 1, extension No. 4.....	103,800	81,900	185,700
Total auxiliary.....	6,806,400	1,453,500	8,259,900
Third Locks dredging—New Miraflores Locks bypass channel: South approach.....	26,500	74,800	101,300
Total, Third Locks.....	26,500	74,800	101,300
Grand total:			
Fiscal year 1947.....	7,853,400	1,831,400	¹ 9,684,800
Fiscal year 1946.....	12,105,100	1,846,700	¹ 13,951,800

¹ In addition 34,520 cubic yards of Chamé sand were produced in fiscal year 1947 and 36,755 cubic yards in 1946.

Dredging operations are divided into three major districts: the Atlantic district extending from contour 42 feet below mean sea level in the Atlantic Ocean to Gatun Locks; the Central district, extending from Gatun Locks to Pedro Miguel Locks; and the Pacific district, extending from Pedro Miguel Locks to contour 50 feet below mean sea level in the Pacific Ocean. The total excavation in these three areas, exclusive of Third Locks excavation, is summarized as follows:

	District			Total
	Atlantic	Central	Pacific	
Canal prism:	<i>Cubic yards</i>	<i>Cubic yards</i>	<i>Cubic yards</i>	<i>Cubic yards</i>
Earth.....	205,300	761,200	54,000	1,020,500
Rock.....		303,100		303,100
Total.....	205,300	1,064,300	54,000	1,323,600
Auxiliary:				
Earth.....	6,698,600		107,800	6,806,400
Rock.....	1,370,600		82,900	1,453,500
Total.....	8,069,200		190,700	8,259,900
Total (exclusive of Third Locks):				
Earth.....	6,903,900	761,200	161,800	7,826,900
Rock.....	1,370,600	303,100	82,900	1,756,600
Grand total:				
Fiscal year 1947.....	8,274,500	1,064,300	214,700	¹ 9,553,500
Fiscal year 1946.....	6,421,000	965,100	4,630,500	¹ 12,016,600

¹ Does not include Chagres River gravel or Chame sand service.

ORDINARY CHANNEL MAINTENANCE—CANAL PRISM DREDGING

ATLANTIC DISTRICT

Atlantic entrance.—Maintenance dredging on the Atlantic entrance section of the Canal channel was in progress $12\frac{3}{4}$ days during the year by the pipe-line suction dredge *Las Cruces*, which removed a total of 205,300 cubic yards of earth.

CENTRAL DISTRICT

Gatun Lake.—A total of 293,900 cubic yards of earth was removed in maintaining the Gatun Lake section of the Canal channel. This dredging was performed by the pipe-line suction dredge *Las Cruces*, which was employed 22 days on the work.

Gaillard Cut.—A total of 358,600 cubic yards of material was removed in maintaining Gaillard Cut. This dredging was performed by the dipper dredge *Cascadas*, which was employed $126\frac{3}{4}$ days on the work.

Project No. 13.—This project, which consists of widening Culebra Reach by 200 feet to the westward, was started in January 1935 and has been continued on a low-priority basis since that time. A total of 224,300 cubic yards of rock were broken by shore mining; and 268,600 cubic yards of material, consisting of 171,600 cubic yards of mined rock and 97,000 cubic yards of earth, were sluiced into the Canal prism to be removed by regular dredging operations. During 1947 dipper dredges excavated a total of 411,800 cubic yards from this project, as follows:

Equipment	Days worked	Yardage dredged		
		Earth	Rock	Total
<i>Cascadas</i>	108 $\frac{3}{4}$	144,400	¹ 245,400	389,800
<i>Paraiso</i>	5 $\frac{1}{2}$	16,300	² 5,700	22,000
Total.....	114 $\frac{1}{4}$	160,700	251,100	411,800

¹ 170,400 cubic yards mined; 75,000 cubic yards unmined.

² 4,200 cubic yards mined; 1,500 cubic yards unmined.

PACIFIC DISTRICT

Pacific entrance, maintenance.—A total of 37,000 cubic yards of earth was removed in maintaining the Pacific entrance section of the Canal channel. This dredging was performed by the dipper dredge *Cascadas*, which was employed $12\frac{1}{2}$ days on the work.

Pacific entrance, project I-B.—A total of 17,000 cubic yards of earth was dredged on this project during 1947. The dredging was performed by the dipper dredge *Cascadas*, which was employed $5\frac{1}{2}$ days on the work.

AUXILIARY DREDGING—OTHER PROJECTS

ATLANTIC DISTRICT

Cristobal outer harbor.—The pipe-line suction dredge *Las Cruces* worked 97 days during 1947 and excavated 2,234,500 cubic yards of silt, sand, and clay.

Cristobal approach channel.—Dredging of the Cristobal approach channel, Cristobal inner harbor, was in progress 98½ days during the year. A total of 2,147,200 cubic yards of material was removed, details of which follow:

Equipment	Days worked	Yardage dredged		
		Earth	Rock	Total
<i>Las Cruces</i>	55¾	1,300,200	21,000	1,321,200
<i>Mindi</i>	42½	661,500	164,500	826,000
Total.....	98½	1,961,700	185,500	2,147,200

Cristobal inner harbor.—Maintenance dredging in Cristobal inner harbor was in progress 6 days during the year by the pipe-line suction dredge *Mindi*. A total of 133,500 cubic yards of earth was removed.

Colon fill.—The pipe-line suction dredge *Mindi* worked 198½ days in Manzanillo Bay, dredging material required to make a fill on the undeveloped portion of Manzanillo Island for the Republic of Panama. The fill is to be used in connection with the extension of the Colon town site. The dredge excavated 2,544,600 cubic yards of material, including 676,800 cubic yards of unmined coral rock and 1,867,800 cubic yards of earth.

Colon Corridor road fill.—The pipe-line suction dredge *Mindi* worked 95½ days in the southern portion of Folks River, Manzanillo Bay, dredging material required to make a fill for the Colon Corridor road for the Republic of Panama. The dredge excavated 886,800 cubic yards of material, which included 410,000 cubic yards of unmined rock and 476,800 cubic yards of earth.

Silver City fill.—The pipe-line suction dredge *Mindi* worked 9 days in the southern portion of Folks River, dredging material to make a fill adjacent to Silver City. The dredge excavated 109,600 cubic yards of material consisting of 88,000 cubic yards of unmined rock and 21,600 cubic yards of earth.

Deep-drilling test, New Gatun Locks by-pass channel, north approach.—Derrick Barge No. 157 was in service 54 days operating as a clam-shell dredge in the New Gatun Locks by-pass channel, north approach, in the experimental deep drilling and blasting test for the special engineering division. The derrick barge excavated a total of 13,000 cubic yards of material which consisted of 10,300 cubic yards of mined rock and 2,700 cubic yards of earth.

PACIFIC DISTRICT

Balboa Harbor, maintenance.—Maintenance dredging in Balboa Harbor was in progress 1 day during the year by the dipper dredge *Cascadas*, which excavated 5,000 cubic yards of material, of which 1,000 cubic yards were unmined rock and 4,000 cubic yards were earth.

Balboa Harbor, project No. 1, extension No. 4.—The dipper dredge *Cascadas* worked 66 days on this project. A total of 185,700 cubic yards of material was removed, of which 74,900 cubic yards were mined rock, 6,000 cubic yards unmined rock and 103,800 cubic yards earth.

THIRD LOCKS DREDGING

Dredging operations on the Third Locks project were continued during the first 2 months of the fiscal year. Work was performed only on the New Miraflores Locks by-pass channel, south approach.

During August 1946 the work on wet excavation, Third Locks project, was suspended pending the results of studies authorized by the Seventy-ninth Congress of the United States under Public Law 280.

Details of the dredging performed on the New Miraflores Locks by-pass channel, south approach, are as follows:

Equipment	Days worked	Yardage dredged		
		Earth	Rock	Total
<i>Cascadas</i>	23	25,600	56,400	82,000
<i>Paraíso</i>	9½	900	18,400	19,300
Total.....	32½	26,500	74,800	101,300

The total excavation to date from the south approach channel is 9,254,900 cubic yards. The by-pass channel was 88.7 percent completed at the end of the year.

ISTHMIAN CANAL STUDIES (PUBLIC LAW NO. 280)

Core samples were taken in widely scattered areas along the present Canal, the Gatun-Chorrera route and the Lagarto-Chorrera route. A total of 189 holes, with a combined depth of 45,444 feet, was drilled.

SLIDES

Excavation from slides in Gaillard Cut from June 30, 1913, to June 30, 1946, totaled 51,993,900 cubic yards. No slide material was excavated in Gaillard Cut during the past fiscal year. Slide activity throughout the Cut was generally much less than in previous years. Culebra Slide (West) continued to be the most active of the slides, with a characteristic slow and steady movement throughout the year. Shore mining was in progress for 173 days and 7,400 cubic yards of rock were broken. Small movements were observed in one other slide area during the year. Numerous small bank breaks occurred which were all limited to movements of no consequence. There was no interference with shipping on account of slides during the year.

SUBSIDIARY DREDGING DIVISION ACTIVITIES

Sand and gravel.—During the past fiscal year 30,200 cubic yards of sand and gravel of all classes (both run-of-bank and washed) were shipped from the gravel stock pile at Gamboa, as compared with 62,123 cubic yards shipped in the previous fiscal year. No run-of-bank gravel was pumped into the stock pile at Gamboa.

The craneboat *Atlas* was in service for 39½ days excavating 34,520 cubic yards of sand at Chamé Point, Republic of Panama. This sand was pumped into barges and delivered at dock 7, Balboa, for the supply department.

Hyacinth control and other activities.—The Canal and adjacent waters through Gaillard Cut, Miraflores Lake, and Gatun Lake (including all dump areas) were periodically patrolled throughout the year for the purpose of keeping the growth of hyacinths under control. Log booms at the mouths of the Chagres and Mandinga Rivers were maintained to prevent hyacinths, logs, floating islands, and other obstructions from entering the Canal channel during freshets or spilling at Madden Dam. During the year, periodical inspection trips were made in the Chagres, Mandinga, Frijoles, and Azules Rivers and along the shores of Barro Colorado Island, Pena Blanca and Gigante Bays, dumps Nos. 1 to 14, and Miraflores, Pedro Miguel, and Red Tank Lakes. Weekly inspection trips were also made of the Canal channel between Gamboa and Gatun.

It is estimated that 34,983,000 hyacinth plants were destroyed during the past year, of which 10,368,000 were pulled and 24,615,000 were sprayed; of the plants pulled 4,893,000 were removed by the debris cableway. One hundred and twenty-five cords of driftwood were removed by the debris cableway during the past year, and an additional estimated 249 cords of driftwood were picked up along the banks of the Chagres, Mandinga, and Cocoli Rivers, Gaillard Cut and Gatun, Miraflores, Pedro Miguel, and Red Tank Lakes.

EQUIPMENT

The more important items of dredging equipment or plant were operated during the past year as shown in the following tabulation:

Unit and name	Type	In service	Out of service	
			Repairs	Reserve or stand-by
		Months	Months	Months
Dredges:				
<i>Cascadas</i>	15-yard dipper.....	11.3	0.7	
<i>Gamboa</i>	do.....			12.0
<i>Paraíso</i>	do.....	.5	.5	11.0
<i>Las Cruces</i>	24-inch suction.....	6.1	2.3	3.6
<i>Mindi</i>	28-inch suction.....	11.5	.5	
Crane boat <i>Atlas</i>	75-ton.....	11.5	.5	
Derrick barge No. 157.....	40-ton.....	5.7	.4	5.9
Grader Barge No. 4.....	14-inch pumps.....	11.8	.2	
Relay barges:				
No. 3.....		4.9	.1	7.0
No. 24.....				12.0
Drill boats:				
<i>Terrier No. 2</i>	Steam.....			12.0
<i>Teredo No. 2</i>	do.....			12.0
<i>Vulcan</i>	Air.....	10.6	.9	0.5
<i>Thor</i>	do.....	1.3		10.7
Air compressor No. 29.....	2,500 cubic feet per minute.....	12.0		
Floating cranes:				
<i>Ajax</i>	250-ton.....	5.8	.5	5.7
<i>Hercules</i>	do.....	6.2		5.8
Ferry boats:				
<i>Presidente Amador</i>		9.0	3.0	
<i>Presidente Roosevelt</i>		12.0		
<i>Presidente Porras</i>		3.0	2.6	6.4

In addition to the above, large and small tugs and an attendant fleet of dump scows, sand barges and service lighters, launches, quarter boats and related drilling and excavating equipment were also operated as part of the dredging plant.

FERRY SERVICE

Thatcher Ferry service was continuous throughout the past year with the exception of a few hours during the period of light traffic on 10 nights, when it was necessary to suspend service in order to repair the ferry ramps and slips. This ferry crosses the Canal at the Pacific terminal and connects Balboa on the east bank with Thatcher highway on the west bank. Service was maintained by rotating the three ferry boats, *Presidente Amador*, *President Roosevelt*, and *Presidente Porras*, keeping two of these ferries in continuous service.

Since the opening of the bridge across the Canal at Miraflores in May 1942, the ferry traffic has become fairly well stabilized. In the following table are shown the more important statistics relative to operations of the Thatcher Ferry for the past three fiscal years:

	Fiscal year		
	1947	1946	1945
Single trips made.....	55,601	51,263	55,928
Vehicles carried:			
Panama Canal vehicles.....	15,597	15,347	29,472
United States Military vehicles.....	82,231	101,628	138,916
Commercial trucks.....	113,640	93,764	79,042
Commercial passenger cars.....	140,246	92,766	91,964
Private cars.....	232,801	202,474	188,982
Total vehicles carried.....	584,515	505,979	528,376
Total passengers carried.....	2,923,599	2,401,329	2,785,612

INVESTIGATION OF MEANS OF INCREASING THE CAPACITY AND SECURITY OF THE PANAMA CANAL

An investigation of means for increasing the capacity and security of the Panama Canal to meet the future needs of interoceanic commerce and national security, including a restudy of the Third Locks project, was authorized by Public Law No. 280, Seventy-ninth Congress, first session, approved December 28, 1945. This act also authorized the making of such studies as may be deemed necessary to determine whether a canal or canals at other locations, or any new means of transporting ships across land, may be more useful than the present Canal with improvements for the purposes stated. A report of these studies is to be made to the Congress, through the Secretary of War and the President, not later than December 31, 1947.

Studies were made of the lock and sea-level canal possibilities at 30 locations on the American Isthmus. Methods were analyzed for increasing the capacity and security of the existing Panama Canal. A prediction and analysis of potential traffic of the Panama Canal to the year 2000 was made by a traffic and commerce expert of the University of Pennsylvania.

Navigation requirements as they affect the dimensions and alignment of the channel and the requirements for the control of currents were developed after consultations with pilots, ship owners, and marine

operating personnel at the Panama, Suez, Houston and Cape Cod Canals; consultations with the Navy Department; and from ship-model tests made by the United States Navy. A hydraulic model of the Panama sea-level canal was constructed and operated to determine the effect of tides and the most favorable methods for tidal regulation.

The bases for fixing safe excavation slopes were established by engineering analyses, laboratory tests of soils and rocks, and studies of the slides that occurred during and after construction of the existing Panama Canal.

Information on modern weapons was supplied by the Offices of the Chief of Engineers, Chief of Chemical Corps, and the Chief of Ordnance, United States Army; the Manhattan District; and the United States Atomic Energy Commission. The strengths of soils and rocks when acted upon by dynamic forces resulting from explosives were studied under a research contract with Harvard University. The conclusions reached on the effects of bombing on canal structures and channels were reviewed by special consultants and authorities in the fields of soil mechanics, dynamics, and seismology. Analytical studies supplemented by tests of explosives in Canal Zone materials were made to determine the effects of modern weapons in order to develop the best means of protecting the Canal against bombing and sabotage and the most efficient methods of repairing the Canal and restoring traffic.

Rainfall and flood flows of the Canal Zone and vicinity were studied, and a flood-control plan for a sea-level canal was developed with the assistance of specialists from the Office, Chief of Engineers, United States Army.

Studies were made of construction methods using large dry-excavating equipment and dredges capable of digging at great depths. Deep-dredging equipment was investigated under contract by three corporations of manufacturers and operators of dredging equipment. Deep subaqueous drilling and blasting tests were made. The Chief of Engineers, United States Army, provided assistance on the design of power plants, dredges, and electrical and mechanical installations. Purchase and operation costs of construction and excavation equipment were furnished by manufacturers, and the methods of cost analysis were reviewed by a special consultant. Studies were made of requirements for townsites, utilities, and other facilities during and after canal construction.

General plans based on the foregoing studies were developed for lock canals and sea-level canals at 8 of the most favorable of the 30 routes. The best plans for a lock canal and for a sea-level canal at each of these 8 routes were selected and analyzed.

A board of consulting engineers, consisting of Admiral Ben Moreell, Brig. Gen. Hans Kramer, Prof. B. A. Bakhmeteff, Mr. Joel D. Justin, Mr. W. H. McAlpine, and Mr. Hibbert M. Hill, appointed by the Governor, advised on all major engineering aspects of the studies. In December 1946 Rear Adm. John J. Manning was appointed to the Board, vice Admiral Moreell, retired.

THIRD LOCKS PROJECT

Final reports were completed on the Third Locks project which was authorized by Public Law No. 391, Seventy-sixth Congress, first session, approved August 11, 1939. The Cucaracha foundation test was completed, while work on the long-term corrosion tests was continued. Excavation of the south approach channel for the New Miraflores Locks was continued through August 1946 by forces of the dredging division. The major portion of the equipment purchased for this work remains in a stand-by status during the suspension of the work on the Third Locks project.

SECTION II

BUSINESS OPERATIONS

The business enterprises operated by The Panama Canal and by the Panama Railroad Co. embrace a number of activities which in the United States would normally be carried on by private enterprise. These activities have been developed to meet the needs of shipping passing through the Canal and of the Canal-Railroad, Army and Navy organizations, and their employees. During the war years these activities were expanded and adjusted to meet the requirements of the war effort and served very important needs of the Army and Navy. The business enterprises include the supply of fuel, provisions, ship chandlery, and repairs to vessels; the provision of public utility services; the maintenance of living quarters, and the sale of food, clothing, and other essentials to Canal and Railroad employees; the handling of cargo and allied operations; the operation and management of a railroad line; and a steamship line between New York and the Isthmus.

The Canal and the Railroad are separate organizations, but the administration of both organizations is vested in the Governor of The Panama Canal, who is also president of the Panama Railroad Co.

PANAMA CANAL BUSINESS OPERATIONS

Business operations of The Panama Canal are conducted separately from operating activities pertaining directly to the transiting of vessels and the government and sanitation of the Canal Zone. The annual appropriation acts for The Panama Canal authorize the expenditure and reinvestment of all moneys received from the conduct of auxiliary business activities, with the proviso that any net profit derived from such business activities shall be covered annually into the Treasury of the United States.

It is the aim to operate the business activities as a whole on a self-supporting basis and, in general, to include as a charge against their operations a fixed capital charge of 3 percent as interest on the net investment. The amount representing charges for interest on investment is a part of the net profits covered into the Treasury and is in effect a reimbursement to the United States. The net investment in business activities totaled \$35,865,808.25 on July 1, 1946, and the capital charge for the fiscal year 1947 was \$1,075,974.24 (table No. 20, sec. V). The net revenue of \$1,142,341.02 (which excludes \$583,938.42 for prior years to be deposited in the Treasury) exceeded the capital charge by \$66,366.78.

MECHANICAL AND MARINE WORK

On the basis of revenues received for work accomplished there was an over-all decrease of 44.3 percent in the volume of business performed by the mechanical division in comparison with the fiscal year 1946. The decline in work required by the United States Army, Navy, and War Shipping Administration (the latter included in "other United States departments" in the table below) caused revenues from these sources to drop from \$6,094,092, or 56.7 percent of the total revenues

in 1946, to \$1,625,925, or 27.1 percent of the total, in 1947. Revenues from The Panama Canal, totaling \$1,759,200 in 1947, declined 27.3 percent from the total in 1946, while those from the Panama Railroad Co. totaling \$893,351, were slightly in excess of revenues of \$843,005 in 1946. Revenues from outside interests increased from \$1,393,297 in 1946 to \$1,711,127 in 1947, a gain of 22.8 percent.

The work load was fairly steady during the year except for a period early in the third quarter when there was practically no commercial marine work. This condition improved somewhat in the fourth quarter.

Normally, work done for the divisions of The Panama Canal organization accounts for approximately 50 percent of the mechanical division work load. This proportion declined to the low of 16.4 percent of the total in 1945; in 1947 it amounted to 29.4 percent of the total.

GROSS REVENUES—CLASS AND SOURCE

The following table shows the class and source of work performed for the past two fiscal years:

	Fiscal year 1947		Fiscal year 1946	
	Revenues	Percent of total	Revenues	Percent of total
Class:				
Marine	\$3,630,509	60.6	\$7,946,824	73.9
Railroad	815,853	13.6	792,406	7.4
Fabricated stock	373,823	6.2	488,767	4.5
Sundries	1,169,418	19.6	1,523,149	14.2
Total	5,989,603	100.0	10,751,146	100.0
Origin:				
The Panama Canal	1,759,200	29.4	2,420,752	22.5
Panama Railroad Co.	893,351	14.9	843,005	7.8
U. S. Army	586,954	9.8	1,323,212	12.3
U. S. Navy	850,414	14.2	1,960,690	18.2
Other United States Departments	188,557	3.1	2,810,190	26.2
Commercial	1,711,127	28.6	1,393,297	13.0
Total	5,989,603	100.0	10,751,146	100.0

¹ Adjusted figure.

REPAIRS TO SHIPS

The following statement shows the number of vessels and the total "ship days", for each category of vessels repaired at Balboa and Cristobal for the fiscal year 1947:

Category	Balboa		Cristobal		Total	
	Number of ships	Ship days ¹	Number of ships	Ship days ¹	Number of ships	Ship days ¹
Commercial:						
Tankers	44	267	55	173	99	440
Other	315	1,164	833	2,178	1,148	3,342
U. S. Army	132	967	114	522	246	1,489
U. S. Navy	57	1,070	37	250	94	1,320
The Panama Canal	23	344	107	591	130	935
Total, 1947	571	3,812	1,146	3,714	1,717	7,526
Total, 1946	1,223	7,970	1,963	7,953	3,186	15,923

¹ Total days consumed in repairing number of ships indicated.

DRYDOCKS AND MARINE RAILWAYS

The following table summarizes drydock and marine railway operations during the fiscal year 1947, with comparative figures for the two preceding years:

Number of vessels drydocked

Category	Fiscal year 1947			Fiscal year	
	Balboa drydocks	Cristobal drydocks and marine railways	Total	1946 total	1945 total
U. S. Army.....	43	26	69	93	121
U. S. Navy.....	32	16	48	65	269
Other United States departments.....	-----	-----	-----	25	56
Commercial.....	38	49	87	42	54
Total outside interests.....	113	91	204	225	500
The Panama Canal.....	18	7	25	37	46
Panama Railroad Co.....	-----	1	1	3	-----
Grand total.....	131	99	230	265	546

During the fiscal year 1947, there were 152 times in which one drydock was unoccupied for 1 workday at Balboa, and 295 times in which one drydock or marine railway was unoccupied for 1 workday at Cristobal.

PLANT IMPROVEMENT

During the fiscal year 1947 work was continued on the plant improvement program authorized and begun during the fiscal year 1945, namely, the installation of machine tools and equipment furnished by the Navy, changes in the electrical power system, and the illumination of the shops.

The physical installation of 71 items of machinery, 60 of which were furnished by the Navy, was accomplished in the Balboa shops, and the physical installation of 40 items of Navy-furnished machinery was accomplished in the Cristobal shops. Power was made available for the operation of 60-cycle machinery now in service or to be located in the Balboa wood shop and instrument repair shop, and the 2,300-volt service to the 1-ton Lectromelt furnace in the foundry was provided. Work is in progress on the installation of 60-cycle power in the pattern shop, foundry, boiler shop, and the pipe and sheet metal shop.

The 60-cycle leads to dock No. 13, Balboa, were completed during the year and the remaining portion of this project will be completed in 1948. Equipment and materials are on hand for installation of facilities to provide 60-cycle and d. c. current to docks Nos. 13, 14, and 15, Cristobal.

ELECTRICAL WORK

The principal activities of the electrical division are the operation and maintenance of the electric light and power system and the construction and maintenance of electrical facilities as required by The Panama Canal and other Government agencies, or by vessels under-

going repairs at the Canal terminals. It also supervises the operation and maintenance of the Panama Railroad-owned telephone, telegraph, electric clock, printing telegraph, and railway signal system.

Following is a comparison of the two principal classes of expenditures of the electrical division for the past three fiscal years:

	Fiscal year		
	1947	1946	1945
Electrical construction and maintenance work.....	\$1,705,888	\$1,906,426	\$2,339,477
Maintenance and operation of electric power system.....	1,223,204	1,061,305	1,173,630
Telephone system and railway signals ¹			243,180

¹ These functions transferred to the Panama Railroad Co. organization July 1, 1945.

Among the principal projects of electrical work carried on during the year were improvements to street-lighting facilities, the wiring of silver vocational and occupational high schools, the improvement of 25- and 60-cycle facilities within the mechanical division area at Mount Hope and Balboa, the wiring of newly constructed gold and silver quarters and the installation of electrical facilities to be used in connection with the construction and operation of the sea level-canal model near Miraflores Locks.

Information concerning the principal construction projects undertaken and the operation of the power system are given on page 41 of this report, under the general heading of Canal Operation. The expenditures shown above include interdepartmental transactions. As an example, maintenance and repairs on the power system are performed by the electric work unit and the cost of this work is therefore included in the expenses of both the power system and the electric work unit.

PURCHASES IN THE UNITED STATES

The principal purchases of supplies for The Panama Canal were made, as heretofore, through the Washington Office of The Panama Canal; the volume of the purchases is indicated by the following table:

	Fiscal year		
	1947	1946	1945
Number of purchase orders placed.....	7,957	8,206	9,543
Value of orders placed.....	\$7,591,828	\$6,355,766	\$7,414,466
Number of disbursement vouchers prepared.....	15,045	17,514	13,369
Value of above vouchers.....	\$9,358,079	\$9,935,612	\$7,660,469
Number of collection vouchers prepared.....	557	476	519
Value of above vouchers.....	\$625,130	\$1,333,763	\$1,685,657
Cash discounts taken.....	\$34,204	\$36,152	\$32,603

STOREHOUSES AND SHIP CHANDLERY

In addition to the main functions of requisitioning, storing and issuing general supplies for the Canal and Railroad (exclusive of the merchandising operations of the commissary division) The Panama Canal storehouses sell ship chandlery and other supplies to commercial shipping, as well as to units of the United States Navy and Army.

The following figures indicate the volume of material and supplies cleared through the stores accounts during the past three years:

	Fiscal year		
	1947	1946	1945
GENERAL STOREHOUSES			
Gross revenues—sales and issues.....	\$9, 585, 596	\$9, 878, 899	\$12, 497, 371
Cost of materials, plus operating expense.....	9, 486, 152	9, 878, 899	12, 456, 774
Net revenues.....	99, 444	0	40, 597
Inventory as of June 30 ¹	11, 185, 146	9, 523, 446	8, 960, 137

¹ This includes all material and supplies of The Panama Canal, by far the greater part of which is in the general storehouses.

OBsolete and UNSERVICEABLE PROPERTY AND EQUIPMENT

During the year disposition was made by sale, or by destruction where the items had no money value, of obsolete or unserviceable property and equipment which had an original value of \$761,809. Replacements were made as necessary.

BULK PETROLEUM PRODUCTS

All deliveries of fuel oil, diesel oil, gasoline and kerosene to and from storage tanks, for private companies and for The Panama Canal, are made through pipe lines and pumping plants of The Panama Canal. The following table summarizes the operation of the oil handling plants for the past three years:

	Fiscal year		
	1947	1946	1945
Fuel and Diesel oil:	<i>Barrels</i>	<i>Barrels</i>	<i>Barrels</i>
Received by The Panama Canal.....	306, 382	331, 016	435, 684
Used by The Panama Canal.....	242, 020	317, 846	372, 721
Sold by The Panama Canal.....	18, 885	19, 506	24, 124
Miscellaneous transfers on tank farms.....	3, 907	16, 693	27, 893
Pumped for outside interests.....	9, 995, 865	30, 081, 448	32, 156, 533
Total barrels handled.....	10, 567, 059	30, 766, 509	33, 016, 955
Handled at Mount Hope (Atlantic side).....	8, 052, 849	19, 286, 943	14, 211, 063
Handled at Balboa and Gamboa (Pacific side).....	2, 514, 210	11, 479, 566	18, 805, 892
Total barrels handled.....	10, 567, 059	30, 766, 509	33, 016, 955
Number of ships discharging or receiving fuel and Diesel oil:			
Panama Canal craft.....	196	250	290
All others.....	2, 089	3, 655	3, 370
Total.....	2, 285	3, 905	3, 660
Gasoline and kerosene received:			
By The Panama Canal:	<i>Gallons</i>	<i>Gallons</i>	<i>Gallons</i>
Bulk gasoline.....	11, 676, 512	11, 665, 836	12, 578, 076
Bulk kerosene.....	2, 962, 649	2, 950, 773	2, 655, 954
By Outsiders:			
Bulk gasoline.....	25, 999, 761	29, 399, 902	23, 001, 664
Bulk kerosene.....	2, 925, 436	6, 242, 856	3, 427, 913
Financial results of operations:			
Total revenues.....	\$2, 140, 793	\$2, 101, 440	\$1, 583, 027
Total expenditures (including cost of sales).....	2, 063, 244	2, 042, 160	1, 328, 820
Net revenues.....	77, 549	59, 280	254, 207

BUILDING CONSTRUCTION AND MAINTENANCE

The program of construction under way at the end of the fiscal year 1946 was continued in 1947.

The principal projects of building construction for The Panama Canal completed by the building division are shown in the following paragraphs. Unless otherwise specified, the projects listed are new buildings:

Ancon-Balboa.—One type-104, 19 type-112, and one type-102 family quarters; reconstruction of gold quarters building No. 220; alterations and additions to Balboa clubhouse.

La Boca.—Conversion of buildings Nos. 920, 905-B, and 928 to bachelor quarters.

Pedro Miguel.—Toilet and locker facilities at Miraflores Locks.

Cristobal.—Alterations and extensions to clubhouse.

Margarita.—Six type-218, two type-112, and nine type-104 family quarters.

Silver City.—Four frame-type family quarters; elementary school.

Camp Coiner.—Six masonry-type, five type-127, two type-128, and two type-129 family quarters.

Gatun.—Toilet and locker facilities at locks.

In addition to the principal projects listed above, which were completed during the year for The Panama Canal, work was performed for the Panama Railroad Company, the Army and Navy, and for employees.

The volume of operations as measured in financial terms totaled \$4,560,073, as compared with \$4,268,083 in the fiscal year 1946. Although there was a decrease in new construction for Canal divisions, this decrease was more than offset by the volume of maintenance work which had been deferred during the war years. There was a decline in work for the Army and Navy but there were indications in the latter part of the year that this business might increase in the near future. Work performed for employees decreased considerably from the previous year.

The total volume of work for the past three years is summarized as follows:

	Fiscal year		
	1947	1946	1945
For Canal divisions	\$3,659,112	\$3,331,543	\$2,546,574
For Panama Railroad Company	417,543	263,854	214,946
For other departments of the Government, employees and others.....	483,418	672,686	1,060,560
Total	4,560,073	4,268,083	3,822,080

QUARTERS FOR EMPLOYEES

Gold employees.—Replacement of quarters was continued, a total of 73 apartments having been constructed during the year. At the close of the fiscal year 24 apartments were under construction.

The principal change in the operation of quarters for gold employees

was an adjustment of rental rates which became effective January 1, 1947. The new rental rates averaged approximately 25 percent higher than the former rates, although the increase was not uniform in all classes of quarters. At the same time, the rates for janitor service, care of grounds, and maintenance of furniture were also increased.

On June 30, 1946, there were 121 applications for family quarters from regular employees in all districts, and on June 30, 1947, 28 applications were on file, a decrease of 93 from the previous year. Under existing regulations employees are required to have an assignment to family quarters before permission is granted for their families to come to the Canal Zone. In addition, there are on file 434 applications for provisional or temporary assignment from employees of other agencies on the Isthmus who are entitled to occupy available Canal quarters in accordance with assignment rules.

Silver employees.—The operation of quarters for silver employees was continued on substantially the same basis as in previous years. Construction of experimental types of housing units, begun in fiscal year 1946, was continued during the year, 10 buildings containing 28 apartments having been completed in the silver town of Camp Coimer. Ninety-six apartments at Gamboa were transferred from gold use to silver family quarters, and one 40-room gold bachelor building was transferred for use in housing silver bachelors. The laborers' barracks at Gatun and Cocoli remained closed during the year. Barracks in La Boca and Camp Biedr were closed due to the repatriation during the year of contract laborers. Some of these buildings have been converted for use as bachelor rooms and dormitories and similar disposition will be made of the others whenever practicable.

The revenue from rentals was inadequate to meet normal operation and maintenance during the year and a severe curtailment of maintenance was necessary to avoid incurring a deficit. An increase of rental and other charges to provide additional revenue will be necessary to meet increased expenses in the coming year. All preliminary work in this connection has been completed and the adjustment is scheduled to be effective September 1, 1947.

The demand for quarters for silver employees is still far in excess of supply. As of June 30, 1947, there were 1,130 applications for family quarters and 950 applications for bachelor quarters, a total of 2,080 as compared with 1,760 on file June 30, 1946.

MOTOR TRANSPORTATION

The motor transportation division is charged with the operation and maintenance of motor transportation for the departments and divisions of The Panama Canal and Panama Railroad Co. The centralization of transportation facilities in this Division and the requirement that it be operated on a self-sustaining basis have been primarily for the purpose of supplying needed transportation at minimum cost to The Panama Canal and Panama Railroad Company. Repair work is also performed for employees and for contractors engaged in work for the Government of the Canal Zone.

The public transportation system of privately owned busses under the supervision and control of the motor transportation division continued to carry employees and their families in and between the various towns of the Canal Zone; 127 busses were operating as of June 30, 1947.

Revenues of the division during the past year, including motor repair shop activities, totaled \$2,024,033, and the expenses, \$2,043,116, leaving a net deficit of \$19,083 for the fiscal year 1947.

In the fiscal year 1947, 81 cars and trucks were purchased and 22 cars and trucks were retired. At the close of the fiscal year 903 cars and trucks, 35 trailers, and 7 motorcycles were on hand.

PANAMA CANAL PRESS

The operations of the Panama Canal Press were continued under the same policies as heretofore. The printing plant carries stocks of materials, and prints such forms, stationery, etc., as are required on the Isthmus in connection with the operation of The Panama Canal and the Panama Railroad Company.

The following is a summary of the financial operations of this plant during the past three years:

	Fiscal year		
	1947	1946	1945
Gross sales revenues.....	\$481,833	\$475,757	\$518,594
Total expenses (including cost of materials used in manufacturing and cost of stationery stores not processed).....	459,393	465,375	506,347
Net revenues.....	22,440	10,382	12,247

SUBSISTENCE

The subsistence section, which was set up May 1, 1941, to provide meals for contract laborers brought to the Isthmus in connection with the large construction program, operated until March 31, 1947, at which time the operation of mess halls was discontinued. The section will be abolished in the next fiscal year.

During the 9 months of 1947 which the section operated, a total of 1,154,628 meals or 384,876 rations were served; the ration cost was \$0.579 per day in 1947 as compared with \$0.443 per day in the previous fiscal year.

REVENUES DERIVED FROM RENTAL OF LANDS IN THE CANAL ZONE

Rentals for building sites and oil-tank sites in the Canal Zone totaled \$54,590 for the year as compared with \$23,942 for the fiscal year 1946. Rentals from agricultural land in the Canal Zone totaled \$7,251 as compared with \$7,097 for the preceding year. At the close of the fiscal year 651 licenses were in effect, covering 1,296 hectares of agri-

cultural land within the Canal Zone. This is a reduction of 36 in the number of licenses as compared with the previous fiscal year and a reduction in the area held under licenses of 50 hectares. This reduction is largely the result of the policy adopted as a health measure in May 1935, that no more licenses for agricultural land would be issued and that holdings under licenses previously granted shall not be sold or transferred.

BUSINESS OPERATIONS UNDER THE PANAMA RAILROAD CO.

The Panama Railroad Co. was incorporated in 1849 under the laws of the State of New York for the purpose of constructing and operating a railroad across the Isthmus. When the concession, rights, and property of the New French Canal Co. were purchased in 1904, ownership of the stock of the Panama Railroad Co. was transferred to the United States Government. Since the acquisition of the railroad by the United States, its corporate status has been preserved and the railroad has continued to function as a common carrier.

At the beginning of Canal construction work, by Executive order of the President of the United States, the Panama Railroad Co. was made an adjunct to The Panama Canal. Its operations are supervised by a board of directors functioning under the direction of the Secretary of War. As the operations of the railroad complement those of the Canal, the policy has been for the board of directors to elect the Governor of The Panama Canal as President of the Panama Railroad Co. Thus, the Governor of The Panama Canal is the administrative head of the Panama Railroad Co. This practice has insured complete coordination of the activities conducted by the two organizations.

As the activities of the Railroad Company are covered in detail in its annual report, only the major features of operation as they relate to Canal administration are covered in this section.

In addition to the operations of the trans-Isthmian railroad, the business enterprises conducted by the Panama Railroad Co. include the following: A steamship line operating between New York and the Canal Zone; the loading, unloading, storage, and transfer of cargo for shipping interests at the terminal ports; the operation of wholesale warehouses, retail stores, and subsidiary manufacturing plants engaged in the supply of food, clothing, and other essential commodities to governmental agencies and to Government employees and their families; and the operation of coaling plants, hotels, a dairy, and a laundry.

TRANS-ISTHMIAN RAILROAD

The railroad line operates between Colon, the Atlantic terminus, and Panama City, the Pacific terminus. In addition to those cities, the railroad serves all nearby activities of The Panama Canal. Gross revenues from the operations of the railroad proper (not including subsidiary business activities) during the fiscal year 1947 amounted to \$2,708,167. Revenue freight totaled 380,164 tons, as compared with 539,292 tons during 1946, a decrease of 159,128 tons.

Comparative statistics covering the significant features of railroad operations during the past three years are presented in the following table:

	Fiscal year		
	1947	1946	1945
Average miles operated, Colon to Panama.....	50.93	50.93	50.93
Gross operating revenue.....	\$2,708,167	\$3,177,256	\$3,244,226
Number of passengers carried:			
First-class.....	234,409	336,610	352,191
Second-class.....	381,840	444,899	429,627
Total.....	616,249	781,509	781,818
Revenue per passenger-train-mile.....	\$4.25	\$5.52	\$5.55
Revenue per freight-train-mile.....	27.15	23.69	19.57
Passenger train mileage.....	144,802	150,170	152,412
Freight train mileage.....	66,020	139,879	155,938
Work train mileage.....	4,864	6,695	6,633
Total train mileage.....	215,686	296,744	314,983
Switch locomotive miles.....	152,106	168,225	180,279

RECEIVING AND FORWARDING AGENCY

This division handles the dock and harbor activities of the Panama Railroad Co. at the two terminals of the Canal. The following statistics summarize the results of operations for the past three years:

	Fiscal year		
	1947	1946	1945
Total revenue.....	\$2,821,982	\$2,495,292	\$2,838,626
Total cargo handled and transferred across docks.....	<i>Tons</i> 1,492,931	<i>Tons</i> 1,237,155	<i>Tons</i> 1,374,679
Cargo stevedored by Panama Railroad Co.....	532,354	404,103	444,476
Cargo ships handled.....	2,823	2,363	2,533
Agency services furnished vessels.....	37	137	99

COALING PLANTS

The volume of coaling plant operations at Cristobal and Balboa for the past three years is shown in the following table:

	Fiscal year		
	1947	1946	1945
Gross revenues.....	\$605,236	\$668,375	\$927,391
Coal sold.....	<i>Tons</i> 29,688	<i>Tons</i> 32,528	<i>Tons</i> 43,627
Coal purchased.....	30,775	31,122	42,279

TELEPHONE SYSTEM

Gross revenues received from the operation of telephones, electric clocks, and electric printing telegraph machines totaled \$370,579.

During the year 1,769 telephones were installed or reconnected and 1,443 were discontinued or removed, resulting in a net increase of 326 telephones for the year. At the end of the fiscal year 1947 there were in service 5,594 telephones, as well as 56 electric clocks and 42 automatic printing telegraph typewriters. Telephone calls handled through the automatic exchanges averaged 103,249 calls per day in 1947 and 110,262 per day in 1946 during the sample days tested. This represents an average of 18.4 calls per telephone per day in 1947, as compared with 20.9 in 1946.

COMMISSARY DIVISION

The primary function of the commissary division of the Panama Railroad Co. is to supply at reasonable prices food, clothing, and household supplies to meet the needs of United States Government personnel and the various United States Government departments on the Isthmus. In carrying out this function the division operates wholesale warehouses and cold-storage plants as well as retail stores in each of the Canal Zone towns. Sales are restricted to agencies and personnel of the United States Government, except that ice, cold storage, food, and other essentials may be purchased by commercial steamships passing through the Canal or calling at its terminal ports.

SALES

Net sales for the fiscal year 1947 totaled \$32,278,463, compared with \$37,126,703 for the previous fiscal year. The value of merchandise on hand June 30, 1947, was \$5,941,239 compared with \$4,391,680 at the close of the fiscal year 1946. The ratio of sales to inventory indicates a theoretical stock turn-over approximately every 9½ weeks. The distribution of sales for the past three fiscal years is shown in the following table:

	Fiscal year		
	1947	1946	1945
U. S. Government (Army and Navy).....	\$1,775,569	\$2,846,043	\$4,807,204
The Panama Canal.....	3,479,546	3,929,709	3,919,390
The Panama Railroad.....	359,517	435,360	409,118
Individuals and companies.....	1,137,669	1,164,454	1,560,284
Commercial ships.....	1,221,529	5,766,264	5,271,972
Employees.....	25,251,773	24,263,250	23,473,518
Gross sales.....	33,225,603	38,405,080	39,441,486
Less discounts, credits, etc.....	947,140	1,278,377	1,306,781
Net sales.....	32,278,463	37,126,703	38,134,705

PURCHASES

Purchases during the year aggregated \$28,308,129, a decrease of \$3,031,289 from the previous year. The following tabulation shows the value of the various classes of merchandise purchased for the past three years:

	Fiscal year		
	1947	1946	1945
Groceries	\$8,428,747	\$8,026,090	\$8,277,928
Candles and tobacco	1,053,100	1,078,020	1,055,372
Housewares	1,799,954	1,603,321	1,414,161
Drygoods	5,326,586	4,872,129	4,233,129
Shoes	1,483,260	1,764,736	1,374,806
Cold storage	5,116,441	7,399,124	7,198,676
Raw material	1,563,389	1,917,218	1,895,271
Cattle	472,853	1,062,968	1,266,479
Milk and cream	294,431	384,539	423,384
Dairy products	2,749,131	3,231,273	2,680,178
Dairy farm herd	20,237		
Total	28,308,129	31,339,418	29,819,474

HOTELS

The Hotels Tivoli and Washington were operated by the Panama Railroad Co. without change of policy during the year. These hotels are an essential adjunct to the Canal, providing necessary accommodations for foreign visitors, American tourists, visiting Government officials, and others.

The gross revenue from hotels was \$947,203, as compared with \$994,341 in 1946, and the number of guest days was 98,652 compared with 102,632 in 1946.

MINDI DAIRY

Effective January 1, 1947, the operation of the Mindi Dairy as a separate function of the company was discontinued and the activity was incorporated into the commissary division as a productive plant.

The investment in pastures, buildings and equipment, and the corresponding accrued depreciation were transferred to "Commissary Plants and Stores." The result of operations for the first 6 months of the year was transferred to and included in commissary operations.

PANAMA LINE

The Panama Line, which had been inactive since 1942 insofar as the normal operation of service between New York and the Canal Zone was concerned, resumed operation of its three combination passenger-cargo vessels during the fiscal year 1947. Throughout the war period, the steamers *S. S. Panama* and *S. S. Cristobal* were operated by the United States Army as troop transports, while the *S. S. Ancon*, after being utilized as a troop transport for a short period, was converted by the United States Navy into a communications and command ship.

The first postwar voyage in the New York-Canal Zone service was made by the S. S. *Panama* on September 20, 1946, followed by the S. S. *Cristobal* on February 5, 1947, and the S. S. *Ancon* on June 26, 1947. Full reconversion and refitting of the steamers S. S. *Cristobal* and S. S. *Panama* are not complete, since the urgent need for their services made it necessary to defer taking them out of service for such work until the 1947-48 winter season when the service demands will be lessened. The S. S. *Ancon*, however, has been completely reconverted and reequipped, and will follow a regular schedule.

The gross operating revenue of the Panama Line for the fiscal year 1947 was \$2,438,160, and the gross operating expenses totaled \$2,264,036, resulting in a net profit from operations of \$174,124.

Freight carried during the year totaled 124,534 tons. Freight for account of The Panama Canal and other departments of the United States Government in the Canal Zone was carried at tariff rates but passengers for account of those departments were carried at reductions from tariff rates ranging from 25 to 71 percent.

SECTION III

ADMINISTRATION

DEPARTMENTS

The organization of The Panama Canal on the Isthmus embraces five principal departments, namely, operation and maintenance, supply, accounting, executive, and health. In addition, an office of The Panama Canal is maintained in Washington, D. C. The Panama Railroad Co., a Government-owned corporation conducting business enterprises on the Isthmus, is a distinct unit, but it is closely affiliated with and operated as an adjunct to The Panama Canal.

OPERATION AND MAINTENANCE

The department of operation and maintenance includes the management functions and those directly involved in the operation and maintenance of the Canal as a waterway, including the dredged channel, locks, dams, aids to navigation, accessory activities such as shops and drydocks, vessel inspection, electrical and water supply, sewer systems, roads and streets, hydrographic observations, surveys and estimates, and miscellaneous construction other than the erection of buildings. Construction of the third locks, now in a suspended status, and investigation of means of increasing the capacity and security of the Panama Canal, as provided by Public Law No. 280, approved December 28, 1945, also are included in this department.

SUPPLY

The supply department is charged with the acquisition, storage, and distribution of materials and supplies for The Panama Canal and Railroad; the maintenance and construction of buildings; the assignment of living quarters; care of grounds; the operation of storehouses, oil-handling plants, an experiment garden, and a printing plant; and the supplying of motor-transportation facilities for the various departments and divisions of the Canal and Railroad organizations.

ACCOUNTING

The accounting department is responsible for the correct recording of financial transactions of the Canal and Railroad; the administrative auditing of vouchers covering the receipt and disbursement of funds preliminary to the final audit by the General Accounting Office; cost keeping of Canal and Railroad; the preparation of estimates for appropriations; and the examination of claims.

EXECUTIVE

The executive department embraces the civil government functions including the administration of police and fire protection, postal service, customs, shipping commissioner duties, estates, schools and, in addition, the general correspondence and records of The Panama Canal and Panama Railroad Co., the personnel administration, wage adjustments, general information, relations with Panama, and the operation of clubhouses, restaurants, and moving-picture theaters.

HEALTH

The health department has jurisdiction over all matters pertaining to sanitation and public health within the Canal Zone and the cities of Panama and Colon, the operation of hospitals and dispensaries, and the enforcement of quarantine regulations.

PANAMA RAILROAD CO.

The operations of the Panama Railroad Co. on the Isthmus are carried on as an adjunct to The Panama Canal. As the Governor of The Panama Canal is also President of the Panama Railroad Co., the heads of all departments, both of the Canal and Railroad organizations, report to him.

CHANGES IN ADMINISTRATIVE PERSONNEL

Mr. William H. Dunlop, in addition to his duties as chief, plans section, was designated budget coordinator, effective July 1, 1946.

Col. Samuel D. Avery, United States Army, was appointed superintendent, Gorgas Hospital, on July 1, 1946, vice Col. Wilmer C. Dreibelbeis, United States Army, relieved from duty with The Panama Canal.

Col. Horace S. Villars, United States Army, was appointed superintendent, Colon-Margarita Hospitals, on July 4, 1946, vice Lt. Col. Merrill H. Judd, Army of the United States, relieved from duty with The Panama Canal.

Col. Murray C. Woodbury, United States Army, was appointed chief, aeronautics section, on July 5, 1946, vice Col. Albert C. Foulk, United States Army, relieved from duty with The Panama Canal.

Lt. Col. David McCoach III, United States Army, was appointed planning engineer on July 13, 1946, vice Lt. Col. Raymond C. Judd, Army of the United States, relieved from duty with The Panama Canal.

Mr. Ralph J. Chittick was appointed magistrate, Balboa, on July 30 1946, vice Mr. Clarence G. Decker, deceased.

Capt. Walter F. Christmas, United States Navy, was appointed superintendent, mechanical division, on August 3, 1946, vice Capt. Antonio S. Pitre, United States Navy, relieved from duty with The Panama Canal.

Lt. Col. Ellsworth I. Davis, United States Army, was appointed assistant supervising engineer, special engineering division, on August 5, 1946.

Capt. Heber H. McLean, United States Navy, was appointed marine superintendent on September 1, 1946, vice Commodore Stuart A. Maunahan, United States Navy, relieved from duty with The Panama Canal.

Mr. Ernest C. Cotton was appointed printer, The Panama Canal, on December 28, 1946, vice Mr. Theodore A. Aanstoots, retired.

Col. Samuel D. Avery, United States Army, was appointed Chief health officer on January 22, 1947, vice Col. Henry C. Dooling, United States Army, relieved from duty with The Panama Canal.

Col. Horace S. Villars, United States Army, was appointed superintendent, Gorgas Hospital, on January 22, 1947, vice Col. Samuel D. Avery, United States Army, promoted to chief health officer.

Col. William B. Foster, United States Army, was appointed superintendent, Colon-Margarita Hospitals, on January 22, 1947, vice Col. Horace S. Villars, United States Army, promoted to superintendent, Gorgas Hospital.

Capt. Philip G. Nichols, United States Navy, was appointed marine superintendent on April 12, 1947, vice Rear Adm. Heber H. McLean, United States Navy, relieved from duty with The Panama Canal.

Mr. James Marshall was appointed chief, division of civil affairs, on June 4, 1947, vice Mr. Crede H. Calhoun, retired.

Capt. Edward S. Hutchinson, United States Navy, was appointed captain of the port, Balboa, on June 5, 1947, vice Capt. Harry L. Ferguson, Jr., United States Navy, relieved from duty with The Panama Canal.

Mr. Levi E. Neal was appointed master of transportation, Panama Railroad Co., on June 17, 1947, vice Mr. Armand C. Wood, retired.

CHANGES IN ADMINISTRATIVE ORGANIZATION

BUDGET COORDINATOR

Effective July 1, 1946, the chief, plans section, was designated budget coordinator in addition to his former duties. The chief, plans section, and budget coordinator, represents the Governor and the engineer of maintenance in the budgetary administration of The Panama Canal and the Panama Railroad as follows: (a) Study and coordinate recommendations and justifications by department heads concerning employment, equipment, supplies, and services which are for inclusion in the estimates for appropriation; (b) analyze and report upon operations in their relations to budgetary limitations; and (c) coordinate with the comptroller the preparation of the budget and the maintenance of budgetary controls.

EMPLOYEES

The force employed by The Panama Canal and the Panama Railroad Co. is composed of two classes which for local convenience have been designated "gold" and "silver" employees. The terms "gold" employees and "silver" employees originated during the construction period of the Canal from the practice of paying in silver coin common laborers and other unskilled or semiskilled workers employed in the Tropics, while skilled craftsmen and those occupying executive, professional, and similar positions were paid in gold coin, the latter group

being recruited largely from the United States. Although all employees are now paid in United States currency, the original terms used to designate the two classes of employees have been retained for convenience. The terms "gold" and "silver" are applied also to quarters, commissaries, clubhouses, and other public facilities.

The gold employees—that is, those carried on the gold pay roll—comprise those employees who are engaged in the skilled trades and in the executive, supervisory, professional, subprofessional, clerical, and other positions where education, training, and special qualifications are required. The force of silver employees is composed almost entirely of natives of the Tropics, a considerable number of whom are Panamanians. They are employed principally as laborers, helpers, and semiskilled workers on work that does not require the services of highly trained or qualified persons.

Responsibility for personnel administration in The Panama Canal is vested in the division of personnel supervision and management, executive department.

GOLD EMPLOYEES

The distribution of the gold personnel on June 28, 1947, and on June 28, 1946, is shown in the following tabulation:

	As of—		Increase	Decrease
	June 28, 1947	June 28, 1946		
THE PANAMA CANAL				
Accounting department	259	283		24
Dredging division	208	316		108
Gravel plant	1	3		2
Thatcher ferry	30	31		1
Electric power system	54	54		
Electrical work	183	177	6	
Locks division	355	359		4
Marine division	238	242		4
Mechanical division	664	878		214
Meteorology and hydrography	12	11	1	
Municipal work	146	172		26
Sosa Hill quarry	6	6		
Water system	47	44	3	
Office engineering division	94	111		17
Special engineering division	209	132	77	
Offices of—				
Governor	4	4		
Comptroller	7	7		
Engineer of maintenance	15	12	3	
Assistant engineer of maintenance	5	4	1	
Executive secretary	5	5		
General counsel	4	4		
Aeronautics section	7	5	2	
Civil affairs division	65	62	3	
Clubhouses	92	103		11
Collector	20	20		
Correspondence and records	43	49		6
Library	9	10		1
License bureau	4	5		1
Magistrates' courts	4	8		4
Paymaster	18	18		
Pay-roll bureau	40	32	8	
Personnel supervision and management	80	111		31
Police section (including civil intelligence)	236	243		7
Fire section	78	78		
Bureau of posts	151	173		22
Schools division	179	133	46	
Physical education and recreation	23	22	1	
Building division	169	228		59

	As of—		Increase	Decrease
	June 28, 1947	June 28, 1946		
THE PANAMA CANAL—continued				
Buildings and grounds.....	58	64	-----	6
Gasoline stations.....	3	2	1	-----
Motor transportation.....	190	199	-----	9
Oil handling plants.....	45	54	-----	9
Panama Canal press.....	14	16	-----	2
Quarters:				
Janitors.....	1	-----	1	-----
Subsistence.....	3	10	-----	7
Storehouses.....	94	119	-----	25
Sanitation:				
Gorgas Hospital.....	312	333	-----	21
All other units.....	281	287	-----	6
Total, The Panama Canal.....	4,765	5,239	153	627
Net decrease.....			-----	474
PANAMA RAILROAD CO.				
General manager.....	117	132	-----	15
Receiving and forwarding agency.....	124	117	7	-----
Commissary division.....	347	367	-----	20
Hotels.....	25	27	-----	2
Telephone section.....	35	31	4	-----
Signal section.....	5	5	-----	-----
Total, Panama Railroad Co.....	653	679	11	37
Net decrease.....			-----	26
Total force.....	5,418	5,918	164	664
Net decrease, total force.....			-----	500

NOTE.—Part-time employees numbering 165 on June 28, 1947, and 87 on June 28, 1946, are not included in the above table.

A general decline in activity resulted in a net reduction of 500, or 8.4 percent, in the over-all gold force in comparison with the number employed on June 28, 1946. As will be noted in the foregoing table, the principal numerical decreases occurred in the dredging division, the mechanical division, and the building division. In contrast with the general downward trend were substantial increases in two units, viz, the special engineering division and the schools division. The force of the special engineering division advanced from 132 in June 1946 to 209 in June 1947, a gain of 77 employees; the larger force in this unit was necessary to carry forward the investigation of means of increasing the capacity and security of the Canal as provided by Public Law No. 280, approved December 28, 1945.

The increase of 46 indicated for the schools division in the foregoing table does not present an exact picture of the net change in the gold strength of the division between June 28, 1946, and June 28, 1947. Although both reports were compiled following the end of the school year, the 1946 report reflects a greater number of vacant positions than did the report for 1947, resulting from resignations following the end of the school year. In the force reports of May 31, 1946, and May 24, 1947, which were compiled when the schools were in session, and thus represent a better index of the actual strength in the 2 years, a gain of 28 employees is indicated. This gain of 28 was made up for the most part of supervisory positions in the new silver occupational high schools and additional instructors required to take care of the heavy increase in enrollment in the gold schools.

RECRUITING AND TURN-OVER OF FORCE—GOLD EMPLOYEES

The following table shows additions to and separations from the gold force of The Panama Canal and the Panama Railroad Co. during the fiscal year 1947:

	Panama Canal	Panama Railroad	Total
Additions.....	1, 114	103	1, 217
Separations:			
Resignation.....	867	96	963
To enter military service.....	18	3	21
Reduction of force.....	245	9	254
Termination of temporary employment or reassignment.....	326	9	335
Removal for cause.....	20	2	22
Retirement:			
Age.....	50	9	59
Disability.....	35	7	42
Optional.....	20	—	20
Involuntary.....	5	1	6
Disability—not qualified for retirement.....	8	1	9
Inefficiency.....	2	—	2
Transfer to other departments.....	15	2	17
Disqualified in trial period.....	2	2	4
Death.....	20	4	24
Total separations.....	1, 633	145	1, 778
Net separations.....	519	42	561

NOTE.—The above figures do not include 112 terminations of employees on part-time or irregular basis, or 6 terminations of American citizens on the silver roll.

As the figures of net separations in the table above were taken from the weekly personnel reports, which usually lag a week or 10 days behind the actual termination dates, there is a difference of 61 in the number of net separations and the net decrease in force as shown on page 74. The actual net decrease in force was 500 as shown on page 74.

Based on an average aggregate gold force of 5,793 for the period covered, the 1,778 separations from all causes shown in the foregoing table represent a turn-over of 31 percent, as compared with 43 percent reported in 1946. When separations by termination of temporary employment or reassignment are excluded, the turn-over rate is 24.9 percent for 1947 as compared with 39.7 percent for 1946; and when separations due to reduction of force also are excluded, the rate for 1947 is 20.5 percent as compared with 31.7 percent for 1946.

Employment.—Of the total additions to the force during the fiscal year 1947, 437 were employed or reemployed in the United States, as against 810 during the previous year. The total additions during the year included 221 veterans restored to duty following military or naval service. Applicants for employment with veterans' preference, as defined by the Veterans' Preference Act of 1944, have been given priority in job placement and 342 such employments were made during the year, for a total of 563 veteran employments and restorations. Employments in the United States were made largely for the special engineering division, the locks division in connection with the Gatun Locks overhaul, the health department, and the schools division. With the exception of recruitment for the special engineering division and the locks division, practically all recruitment was replacement

employment, since but few new positions were established and filled during the year.

At the close of the year, there were requisitions pending in the United States for 91 employments. The bulk of these outstanding requisitions was for the schools division, for the annual teacher replacement in September, and for the health department. No veteran restoration requisitions were pending.

During the year the difficulties in transportation of new employees to the Isthmus, which had persisted during the war and immediately after the cessation of hostilities and which resulted in delays in the arrival of new appointees, were overcome to a large extent. Although the steamships of the Panama Line are again in operation and are used to some extent in the transportation of new employees, it has been found more convenient and no more expensive to transport many of them to the Isthmus by plane. This situation is particularly true in the transportation of those from the Southern and Western States. With the decline in size of force, the housing situation locally has eased and now permits the joint arrival in the Canal Zone of new employees and their families.

ADJUSTMENT IN WAGES AND HOURS OF WORK

Salary increases were authorized for all major groups of employees during the fiscal year 1947, with the exception of those employees whose rates of pay are based on navy yard rates in the United States. The 40-hour week which was placed in effect on September 9, 1945, was continued throughout the fiscal year 1947.

SILVER EMPLOYEES

The following table shows a comparison between the silver force of The Panama Canal and Panama Railroad Co. on June 28, 1947, and June 28, 1946:

	As of—		Increase	Decrease
	June 28, 1947	June 28, 1946		
THE PANAMA CANAL				
Accounting department	6	6		
Dredging division.....	1,101	1,599		498
Gravel plant	10	14		4
Thatcher ferry	74	79		5
Electric power system.....	102	104		2
Electrical work	252	286		34
Locks division	1,044	983	61	
Marine division.....	942	1,059		117
Mechanical division.....	1,040	1,355		315
Meteorology and hydrography.....	29	25	4	
Municipal work.....	1,181	1,365		184
Sosa Hill quarry	79	94		15
Water system.....	85	94		9
Office engineering division.....	54	98		44
Special engineering division.....	97	116		19
Aeronautics section.....	27	22	5	
Civil Affairs division.....	3	3		
Clubhouses	1,175	1,507		332
Correspondence and records.....	40	44		4
Library	3	3		
License bureau.....	1	1		
Magistrates' courts.....	2	2		
Paymaster.....	3	3		

	As of—		Increase	Decrease
	June 28, 1947	June 28, 1946		
THE PANAMA CANAL—continted				
Pay-roll bureau.....	13	15	-----	2
Personnel supervision and management.....	25	27	-----	2
Police section (including civil intelligence).....	51	53	-----	2
Bureau of posts.....	61	49	12	-----
Schools division.....	204	156	48	-----
Physical education and recreation.....	34	33	1	-----
Building division.....	1,215	1,992	-----	777
Buildings and grounds.....	402	554	-----	152
Gasoline stations.....	27	26	1	-----
Motor transportation.....	504	628	-----	124
Oil handling plants.....	114	133	-----	19
Panama Canal press.....	123	143	-----	20
Quarters:				
Janitors.....	177	209	-----	32
Subsistence.....		148	-----	148
Storehouses.....	427	533	-----	106
Sanitation:				
Gorgas Hospital.....	588	630	-----	42
All other units.....	1,068	1,140	-----	72
Total, The Panama Canal.....	12,383	15,331	132	3,080
Net decrease.....			-----	2,948
PANAMA RAILROAD CO.				
General manager.....	514	556	-----	42
Receiving and forwarding agency.....	2,732	2,107	625	-----
Commissary division.....	3,272	3,641	-----	369
Hotels.....	341	276	65	-----
Telephone section.....	20	21	-----	1
Signal section.....	14	12	2	-----
Total, Panama Railroad Co.....	6,893	6,613	692	412
Net increase.....			280	-----
Total force.....	19,276	21,944	824	3,492
Net decrease, total force.....			-----	2,668

¹ Adjusted figure.

NOTE.—Part-time employees numbering 26 on June 28, 1947, and 38 on June 28, 1946, are not included in the above table.

As indicated in the foregoing table, there was a net decrease of 2,668 silver employees (12.2 percent) in comparison with the force as of June 28, 1946. Reflecting the return to more normal operations, large reductions occurred in the majority of the units listed, the more important declines being recorded in the dredging division, mechanical division, clubhouses, and building division. Notwithstanding this general decline in activity, there were a few units in which it became necessary to carry larger forces than reported in the previous year. Included in the latter was the receiving and forwarding agency, a Panama Railroad Co. unit, which increased its force by 625 over June 28, 1946; this increase developed from a 71-percent increase over June 1946 in cargo handled, transferred, and stevedored at the docks as well as, to a smaller extent, to the application of the 40-hour week to 177 regular monthly employees. The hotels, also operated by the Panama Railroad Co., reported an increase of 65 silver employees, this expansion in force resulting from the application of the 40-hour week and an increased night shift in the room department (at the Hotel Tivoli) to meet the revised schedule of arrivals and departures of commercial aircraft.

Units of The Panama Canal which reported substantial increases included the locks division and the schools division. In the locks division there was an increase of 61 employees which were made up for the most part of a temporary force for clean-up operations following the Atlantic Locks overhaul and the adjustment of personnel to complete the force required by the 40-hour week. The increase of 48 in the schools division resulted from the opening of two occupational high schools for colored children, additional instructors for night schools and substitute teachers employed on a fee basis.

SILVER WAGES

Wages of employees of the silver roll bear no direct relationship to wages of corresponding classes of workers in the United States. As silver-roll employees are for the most part natives of the Tropics, their wage scales are established at levels that will insure a standard of living comparing favorably with that prevailing for native workers in the Republic of Panama and elsewhere throughout the Caribbean area. An increase of approximately 6 cents an hour to conform with the generally increased cost of living was authorized for silver workers on July 1, 1946.

SICK AND REST LEAVE

Under the present regulations silver employees earn leave at the rate of 1 hour for each 10 hours of service in the basic workweek, not to exceed 16 hours in each of the 12 pay periods throughout the fiscal year. The maximum accumulation is 480 hours. Two hundred and forty hours of this time are the sick-leave reserve and all hours in excess of 240 may be granted as rest leave or commuted to a cash payment upon termination. The number of hours leave paid during the fiscal year ended June 30, 1947, was 2,887,860.

CASH RELIEF FOR DISABLED SILVER EMPLOYEES

Applications for relief under the act of Congress of July 8, 1937, averaged 39 per month during the fiscal year 1947. The regulations established during the latter part of the fiscal year 1938 for administering this relief were continued without material change.

The table below shows the disposition of all applications from employees of both The Panama Canal and the Panama Railroad Co. during the fiscal year 1947:

Applications	Panama Canal	Panama Railroad	Total
Applications on hand July 1, 1946	33	10	43
Applications received during 1947	397	65	462
Total	430	75	505
Disposition:			
Applications approved for payment	343	71	414
Rejected or found ineligible	38	1	39
Pending	49	3	52
Total	430	75	505

NOTE.—Removal from the rolls on account of the death or subsequent reemployment of cash relief recipients: The Panama Canal, 63; the Panama Railroad Co., 43.

Total and average costs per month during the fiscal year 1947 were as follows:

	Number of cases	Monthly average payment per case	Monthly average payments
Panama Canal rolls.....	958	\$21.55	\$20,647
Panama Railroad Co. rolls.....	302	19.86	5,999
Panama Railroad pensioners.....	¹ 81	¹ 14.33	¹ 1,160
Total.....	1,341	20.74	27,806

¹ Superannuated employees granted cash relief prior to July 8, 1937.

Expenditures on behalf of The Panama Canal cash-relief program are paid from annual appropriations for that purpose, while those of the Panama Railroad Co. constitute a continuation of the former plan of granting cash relief to the superannuated employees of that company and are paid by the Panama Railroad Co.

REPATRIATIONS

In 1934 an appropriation of \$150,000 was provided for the repatriation and rehabilitation of alien former employees (and their families) who have rendered at least 3 years of service with the United States Government or the Panama Railroad Co., on the Isthmus. During the fiscal year 1947, \$2,853 was expended for the repatriation and rehabilitation of 27 former employees and 3 members of their families, a total of 30 persons. To the end of the fiscal year 1947 a total of \$97,474 has been expended from this appropriation.

CENTRAL LABOR OFFICE

The central labor office program of The Panama Canal provides for eligibility control over applicants seeking employment with Government agencies and private contractors operating on Government work in the Canal Zone. A general decrease of employment activities is indicated by the comparative figures presented below, showing the total numbers of silver employees carried on the rolls of the various organizations as of June 1947 and June 1946, the decrease in total force being 17.1 percent:

	June—	
	1947	1946
Panama Canal and Panama Railroad Co.....	19,302	21,982
U. S. Army.....	7,221	9,414
U. S. Navy.....	2,880	4,625
Government contractors and miscellaneous.....	2,065	1,925
Total.....	31,468	37,946

NOTE.—The figures in this table are based on those that the various cooperating agencies report and on which they are assessed to support the central labor office and are exact. Prior to 1947, figures were determined by taking the employment of the preceding June 30 and adjusting them according to reported employment and terminations. Thus, the figures shown above for 1946 do not correspond with those published in last year's report.

Because of the insufficient supply of qualified labor on the Isthmus to handle the heavy construction program carried on during the war emergency, The Panama Canal was forced to resort to the recruitment of contract laborers from the Republic of Colombia, Jamaica, Costa Rica, and El Salvador. With the diminishing need for outside labor since the cessation of hostilities the majority of these workers have been repatriated to their native countries. From the inception of the foreign recruiting program in 1940, 22,265 contract workers have been brought to the Isthmus, of which 21,805 have been returned to their native countries, leaving as of June 30, 1947, a total of 460 remaining on the Isthmus.

SAFETY PROGRAM

During the fiscal year 1945, because of an unfavorable injury rate as compared to other government agencies and an upward trend in the Canal-Railroad rate, it was decided to enlarge and place greater emphasis on the safety program. Additional personnel, designated as safety assistants, was assigned to safety duty and a Panama Canal-Railroad safety board, representing all department heads, was established to review progress of the safety program, make recommendations, and formulate and promulgate safety policies for reducing accidents and injuries.

The fiscal year 1947 was the first year since the establishment of an organized safety program in 1940 that the Canal-Railroad organization failed to show a continued substantial improvement in frequency rate in comparison with the previous fiscal year.

The following statistics cover the accident rates for the Canal-Railroad organization for the seven full fiscal years since institution of the safety program:

Year	Man-hours worked	Lost-time injuries	Frequency rate ¹	Time charges	Severity rate ²	Fatalities
1941.....	72,725,000	5,750	79	214,170	2.94	21
1942.....	92,429,000	4,978	51	238,628	2.58	27
1943.....	94,325,000	3,585	38	230,914	2.45	28
1944.....	80,499,000	2,770	34	158,770	1.97	17
1945.....	70,108,000	2,347	33	90,159	1.29	6
1946.....	61,510,000	1,440	23	81,007	1.32	8
1947.....	51,686,000	1,252	24	79,821	1.54	4

¹ Frequency rate is the lost-time injuries per million man-hours worked.

² Severity rate is the time charges, in days, per thousand man-hours worked.

As will be observed from the above table there also was an increase in the severity rate in 1947 in comparison with the preceding fiscal year, notwithstanding a reduction from 8 to 4 fatalities and 22 to 16 in the number of injuries causing permanent partial or total disability. This increase in the severity rate in face of a decline in the number of such injuries resulted from the application in 1947 of penalty charges totaling 23,019 days carried over from prior fiscal years. The cases originally were reported in the years they occurred, with the subsequent lost time carried over to succeeding years. Upon final disposition of the cases this year and determination of the degree of disability, final charges have been recorded.

The table below shows injury and death compensation benefits for the Canal-Railroad organization for each of the seven years since the institution of the safety program, compared with the annual average for the preceding 23 years:

Yearly average	Injury compensation	Compensation per \$1,000 pay roll
23 years, 1918-40.....	\$51,886	\$3.31
Fiscal year—		
1941.....	86,290	2.55
1942.....	98,830	2.21
1943.....	104,550	2.17
1944.....	120,037	2.58
1945.....	107,585	2.56
1946.....	109,658	2.78
1947.....	110,899	2.75

As noted in the above tabulation there was a decrease from \$2.78 in fiscal year 1946 to \$2.75 in 1947 in the average compensation rate per \$1,000 pay roll, which is well below the 23-year average of \$3.31 experienced prior to the establishment of the safety program. Approximately 76 percent of the compensation payments for 1947 were for injuries and fatalities occurring in prior fiscal years. Payments on some of these prior cases will continue for several years and, therefore, the compensation rate cannot be expected to decrease during the next few years in proportion to the anticipated decrease in work load. These payments would have been materially higher except for the progress in accident prevention resulting from the inauguration of an effective safety program.

EXPERIMENT GARDENS

The Canal Zone plant introduction gardens and experimental station were established in June 1923. The gardens, which include greenhouses, nurseries, and experimental plantings, embrace approximately 125 acres of land, and are devoted to the propagation and cultivation of a wide variety of useful and ornamental plants from all parts of the world, primarily for the purpose of determining their adaptability and value under local soil and climatic conditions, for general propagation on the Isthmus. This unit also designs and supervises all landscape work for The Panama Canal and the Panama Railroad Co., handling a total of 69 projects during the year. In order to help meet the demand for fresh vegetables, the gardens maintain a small, self-supporting vegetable garden.

CLUBHOUSES

The Panama Canal clubhouses unit is charged with the operations of activities designed to provide restaurant, motion-picture, bowling, and other facilities to United States Government personnel, their families and guests. The clubhouses are self-supporting and no appropriations are required for these activities.

During the year, major improvements to the kitchen and refrigerating sections of the Balboa clubhouse were completed and work was proceeding on major alterations and additions to the Cristobal gold

clubhouse, restaurant, and lobby areas. Plans were nearing completion at the end of the year for the erection of an up-to-date clubhouse for silver personnel at Cristobal, and a modern air-conditioned theater to replace the existing outmoded structure at Balboa.

There were no important changes in the prices or in the general management policies during the year. The lessened demand for service resulting from the smaller population caused the shortening of operations hours in certain clubhouses, while the lower volume of business necessitated an over-all reduction in force affecting both gold and silver personnel.

LEGISLATION

Among the laws enacted by the Congress during the fiscal year 1947 which relate to or apply in the Canal Zone or affect The Panama Canal and which are of importance and interest are those described below:

An act approved July 31, 1946, extending the Federal Credit Union Act to the Canal Zone.

An act approved August 2, 1946, authorizing certain administrative expenses in the Government service, and for other purposes.

An act approved August 2, 1946, to provide for increased efficiency in the legislative branch of the Government (Legislative Reorganization Act of 1946), title IV of which act comprises the Federal Tort Claims Act.

An act approved August 7, 1946, extending the benefits of the Panama Canal construction service annuity law of May 29, 1944.

Legislation relating to the Canal Zone introduced during the fiscal year 1947 and still pending in Congress includes:

Four bills (H. R. 171, S. 738, H. R. 1896, and H. R. 2997) to extend the benefits of the Panama Canal construction service annuity law of May 29, 1944.

A bill (S. 1187) to amend the Canal Zone Code so as to add certain provisions concerning a minimum wage and overtime compensation.

Two bills (H. R. 1259 and H. R. 2547) to amend the Canal Zone Code retirement provisions so as to provide for optional retirement after 25 years of service regardless of age.

Two bills (H. R. 1260 and H. R. 2546) to amend the Canal Zone Code retirement provisions so as to extend to persons retired prior to July 29, 1942, the provisions of an amendatory act of that date providing an additional minimum method of computation of retirement annuities.

A bill (H. R. 2273) which would permit an annuitant under the Panama Canal construction service annuity law of May 29, 1944, to receive both an annuity under that law and an annuity for which he may also be eligible under any general retirement law.

A bill (H. R. 2817) to amend the Canal Zone Code in reference to several varied and, for the most part, unrelated subjects.

A bill (H. R. 3080) with reference to improving housing conditions in the Canal Zone.

A bill (H. R. 3190) to revise and codify title 18 of the United States Code (Crimes and Criminal Procedure).

A bill (H. R. 3195) to amend the Canal Zone Code retirement provisions so as to extend them to alien employees.

A bill (H. R. 3214) to revise and codify title 28 of the United States Code (Judicial Code and Judiciary).

A bill (H. R. 3250) to extend eligibility for employment with The Panama Canal or the Panama Railroad Co. to persons who are not citizens of the United States or of the Republic of Panama.

Two bills (H. R. 3513 and S. 1490) to transfer the Panama Railroad pension fund to the Civil Service retirement and disability fund.

A bill (H. R. 3629) to authorize the War Department and Navy Department to transfer to The Panama Canal property which is surplus to the needs of those departments.

Two bills (H. R. 3749 and S. 1416) to amend the Federal Employees Pay Act of 1945 so as to require readjustment of the basic rates of pay of certain wage-board employees of the Panama Railroad Co.

Two bills (H. R. 3837 and H. R. 3838) to amend the Internal Revenue Code so as to extend the Federal income tax to the Canal Zone.

CAPITAL ALLOTMENTS, FISCAL YEAR 1948

The appropriation for 1948 carried \$2,008,000 for improvements and betterments and for the replacement of worn-out or excessively deteriorated facilities as follows:

Quarters for American (gold) employees.....	\$400, 000
Quarters for native (silver) employees.....	300, 000
Gorgas Hospital improvements.....	1, 080, 000
Road and street replacements.....	100, 000
Road extension, Corozal Cemetery.....	28, 000
Miscellaneous minor improvements.....	100, 000
Total.....	2, 008, 000

Brief comment on these projects is given below:

Quarters for American (gold) employees.—This is a continuation of a program for replacement of certain housing for American employees on the gold roll. The units to be replaced are old frame buildings erected during the construction period of the Canal, and which now are in an advanced stage of deterioration.

Quarters for native (silver) employees.—This appropriation is to be used for continuing a program of replacement of unsatisfactory housing for aliens on the silver roll. Many of the units to be replaced were intended originally as temporary structures for the construction period of the Canal, but it has been necessary to keep them in service because of the pressing need for housing.

Gorgas Hospital improvements.—This appropriation is to cover the construction of an obstetrical building at Gorgas Hospital. The new structure will provide facilities for modern and centralized obstetrical services, and at the same time release space required for use of other patients. The obstetrical facilities now in use are inadequate for the proper care of patients.

Road and street replacements.—This appropriation is to be used for the continuance of a program of modernizing the narrow and deteriorated streets and roads of the Canal Zone. The majority of these streets and roads were built to the standards of the period prior to 1924, and are not suited for the weight, volume, and greater speed of traffic now using them.

Road extension, Corozal Cemetery.—This road extension will be constructed to provide access to a new burial ground which it has been necessary to add to the West Indian section of the Corozal Cemetery.

Miscellaneous minor improvements.—The fund provided in this category will permit construction during the year of improvements of a minor nature, the need of which may arise from time to time and which could not be foreseen at the time the budget was prepared.

VISITS OF CONGRESSIONAL PARTIES

Several members of the United States Congress made visits to the Isthmus during the past fiscal year for the purpose of inspecting installations in the Canal Zone. Judge John H. Kerr and Mr. W. F. Norrell, chairman and member, respectively, of the Military Establishment Appropriation Subcommittee of the House of Representatives arrived aboard the steamship *Panama*, of the Panama Line, on November 26, 1946. Judge Kerr departed for the United States on November 29, 1946, but Mr. Norrell was able to prolong his stay until December 19, 1946. Messrs. Albert J. Engel, Francis Case, George H. Mahon, and Harve Tibbott, also members of the Military Establishment Appropriation Subcommittee of the House of Representatives, arrived aboard the steamship *Panama*, on December 16, 1946, and departed for the United States on December 19, 1946.

Senator Robert A. Taft, of Ohio, paid a brief unofficial visit to the Canal Zone, arriving at the Canal Zone Airport on December 2, 1946. He departed for the United States, via Cuba, on December 4, 1946.

Twelve members of the House of Representatives, the majority of whom were members of the Committee on Merchant Marine and Fisheries, arrived aboard the steamship *Panama*, on April 1, 1947, and departed for the United States on the same vessel on April 5, 1947. The party included the following: Messrs. Fred Bradley (chairman), David M. Potts, Willis W. Bradley, Raymond H. Burke, John C. Brophy, Franklin J. Maloney, Herbert C. Bonner, James Domengeaux, Eugene J. Keogh, Emory H. Price, John E. Fogarty, and Henry D. Larcade, Jr.

SECTION IV

GOVERNMENT

The civil government of the Canal Zone is conducted as prescribed in the Panama Canal Act of August 24, 1912, and subsequent acts and Executive orders applicable to the Canal Zone. Whenever practicable, governmental functions have been assigned to departments in the organization established for the operation and maintenance of the Canal. Complete cooperation and increased efficiency are derived from such coordination of functions.

Data on expenses and revenues of various features of Canal operation and government are contained in the financial and statistical statement in section V of this report.

AREA OF THE CANAL ZONE

The total area of the Canal Zone,¹ with areas segregated for various purposes, is shown as of June 30, 1947:

	<i>Land area</i>	<i>Square miles</i>
Military and naval reservations (inclusive of revocable license areas):		
Military reservations.....		89. 83
Naval reservations.....		12. 25
Total.....		102. 08
Canal Zone town sites and areas in active use.....		15. 94
Miscellaneous assigned land areas:		
Barro Colorado Island.....		5. 71
Forest preserve.....		5. 47
Cattle pastures.....		39. 90
Commercial licenses.....		4. 94
Third Locks project.....		. 72
Total.....		56. 74
Swamps.....		15. 16
Remaining usable land.....		172. 26
Total land area of the Canal Zone.....		362. 18
Water area (inclusive of Madden Lake to the + 260-foot contour).....		190. 94
Total area of the Canal Zone.....		553. 12

POPULATION

By compiling information obtained from the chief quartermaster, the land section, the Army and Navy authorities, and by making a house-to-house canvass of persons employed by commercial interests, in March 1947 an estimate was made of the population of the Canal Zone. The estimated population figures include civilian employees

¹ Not inclusive of noncontiguous areas, with the exception of Patilla Point Military Reservation.

of the Army and Navy and their families, and members of the families of Army and Navy personnel, but omit commissioned, warrant, and enlisted personnel of the armed forces.

The following is a summary of the population by districts:

	Americans			All other			Total
	Men	Women	Children	Men	Women	Children	
Balboa district.....	4,692	6,238	5,347	5,034	3,429	5,562	30,302
Cristobal district.....	1,627	2,176	2,022	4,216	2,267	4,742	17,050
Total, 1947.....	6,319	8,414	7,369	9,250	5,696	10,304	47,352
Total, 1946.....	6,881	7,082	5,657	12,853	5,171	10,708	48,352
Total, 1945.....	7,150	5,937	4,040	13,176	6,398	7,987	44,688

The population of March 1947 was 2.1 percent lower than that of the previous year, but 6.0 percent higher than in 1945. While there has been a sharp decrease in the number of men in the past 2 years by reason of diminished activity following the end of the war, there has been a large increase in the population of American women and children. These are largely families of service personnel who were permitted to come to the Isthmus following the end of hostilities. A substantial increase also occurred in the number of children of other nationalities in comparison with the fiscal year 1945.

In addition to the population figures shown above, the records indicated that in March 1947 there were 1,551 Americans (468 men, 519 women, and 564 children) residing in United States Government quarters in New Cristobal, Republic of Panama.

PUBLIC HEALTH

The health of the Canal Zone populace remained relatively good during the year. Excluding malaria and venereal diseases, the average number of reportable diseases per month for the year was 72 as compared with 64 per month during the previous fiscal year, 57 per month during the fiscal year 1945, and 125 per month for the fiscal year 1944. Pneumonia and measles constituted 72 percent of the total number of cases reported during the fiscal year 1947, 40 and 32 percent respectively.

The malarial rate for employees of The Panama Canal and Panama Railroad Co. continued to be relatively low. The rate for the 6-month period January through June 1947 was 14.2 percent in comparison with rates of 15.2 and 11.6 during the similar periods in 1946 and 1945.

Normally acute anterior poliomyelitis cases average three or four a year in this area. During the first 6 months of the fiscal year 1947 there were no cases of poliomyelitis in the Panama Canal hospitals, but in the last 6 months of the year there was an unusual rise in the incidence of this disease. During this period 10 cases were admitted to Panama Canal hospitals. The reason for this unexpected increase in the number of cases of poliomyelitis cannot be definitely explained, but fast steamship and airplane travel to the Isthmus from communities in which the disease is known to be prevalent may have been a factor.

VITAL STATISTICS

The morbidity and mortality rates from diseases and injuries, together with other vital statistics relating to the population of the Canal Zone and the cities of Panama and Colon, are set forth in detail in the report of the health department for the calendar year, which is published annually in booklet form. For this reason, the data herein pertaining to vital statistics are limited to a brief résumé of the important information.

General death rates.—The death rate for the Canal Zone is artificially low in comparison with Panama City and Colon, because employees generally leave the Isthmus after retirement. Below are shown death rates by yearly periods for the past five calendar years:

Death rate per 1,000 population—all causes

	Calendar year				
	1946	1945	1944	1943	1942
Canal Zone ¹	6.31	5.12	6.13	6.24	6.24
Panama City.....	9.44	9.42	10.57	10.49	10.62
Colon.....	12.00	12.32	11.55	12.11	12.13

¹ Omits Army and Navy personnel.

Principal causes of death.—The principal causes of death in each of the groups of population were as follows:

Number of deaths and annual rate per 1,000 population—calendar year 1946

	Canal Zone		Panama City		Colon	
	Number	Rate per 1,000	Number	Rate per 1,000	Number	Rate per 1,000
Organic diseases of the heart.....	46	0.951	114	0.877	54	1.149
Cancer of various organs.....	39	.806	106	.801	41	.872
Pneumonia.....	26	.537	134	1.030	49	1.043
Diseases of the arteries ¹	24	.496	42	.323	21	.447
Tuberculosis.....	19	.393	241	1.854	74	1.574
Apoplexy.....	18	.372	53	.408	38	.808
Nephritis (acute and chronic).....	15	.310	44	.338	28	.595
Syphilis.....	7	.145	23	.177	19	.404
Diarrhea and enteritis.....	1	.020	65	.500	24	.511

¹ Includes following deaths due to diseases of the coronary arteries and angina pectoris: Canal Zone, 17; Panama City, 22; Colon, 9.

Birth rate.—In the Canal Zone a change in the birth rate, as distinct from the number of births, has only limited significance because of the peculiar situation which exists with regard to the population on which the rate is calculated. For the past 6 years, population figures have excluded uniformed personnel of the Army and Navy, but included members of their families, and children born to Army and Navy families are included in the total number on which the rate is calculated.

A factor which depresses the birth rate concerns silver personnel in the Canal Zone. Canal Zone quarters are generally available only to silver employees who have more than average length of service and such employees are therefore in the older-age brackets. A further

variable, although gradually becoming less of a factor, is the number of contract laborers here without their families, which swells the population figures without adding appreciably to the Canal Zone birthrate.

The following table shows the birth rates in the Canal Zone and the terminal cities of Panama and Colon for the past 5 years:

Birth rate per 1,000 population

	Calendar year				
	1946	1945	1944	1943	1942
Canal Zone:					
White.....	44.69	32.23	32.65	27.21	23.08
Colored.....	18.92	18.47	19.07	15.25	13.07
Combined.....	29.42	23.74	24.11	19.48	16.65
Panama City.....	32.52	32.62	34.03	34.06	30.38
Colon.....	38.47	38.81	37.45	34.32	27.38

NOTE.—Population base for Canal Zone excludes Army and Navy uniformed personnel.

Death rates among children under 1 year of age.—The following table shows the infant mortality rates per 1,000 births for the past 5 years:

Death of infants under 1 year of age per 1,000 live births

	Calendar year				
	1946	1945	1944	1943	1942
Canal Zone:					
White.....	17	24	17	24	22
Colored.....	63	44	43	51	53
Combined.....	34	34	30	38	38
Panama City.....	67	72	70	73	79
Colon.....	71	94	84	65	79

MALARIA

The rates for malaria among employees only for the past 10 years are shown below:

Calendar year	Rate per thousand	Calendar year	Rate per thousand
1937.....	12	1942.....	25
1938.....	10	1943.....	15
1939.....	14	1944.....	13
1940.....	17	1945.....	13
1941.....	14	1946.....	12

There were no deaths from malaria among employees during the calendar year 1946.

HOSPITALS

The number of patient-days in Panama Canal hospitals for the past three fiscal years was as follows:

[Patient-days]

	Fiscal year		
	1947	1946	1945
Gorgas Hospital.....	234, 616	273, 183	337, 683
Corozal Hospital:			
Insane.....	89, 600	90, 838	94, 621
Cripples and chronic-medical and surgical cases.....	34, 938	35, 066	35, 317
Colon Hospital.....	52, 711	51, 842	53, 109
Margarita Hospital.....	21, 722	27, 021	28, 406
Palo Seco Leper Colony.....	41, 349	42, 765	43, 159
Total.....	474, 936	520, 715	592, 295

QUARANTINE AND IMMIGRATION

During the fiscal year 1947 inspection was made of 5,653 vessels and 5,136 airplanes, compared with 6,868 vessels and 4,303 airplanes during the previous fiscal year.

No cases of quarantinable disease were encountered at Canal Zone ports during the fiscal year. However, constant vigilance and precautionary measures are exercised toward preventing the introduction of plague, typhus, yellow fever, smallpox, and cholera. During the past year smallpox has been endemic and epidemic in most parts of the world. In this hemisphere there have been outbreaks in the United States and in Central and South America. In spite of the outbreaks in countries close to the Isthmus of Panama no cases occurred in the terminal Isthmian cities, mainly because passengers are required to present evidence of vaccination within 3 years or be vaccinated upon entry into the Canal Zone.

The following is a summary of activities for the fiscal year 1947, together with the figures for the two preceding fiscal years:

	Fiscal year		
	1947	1946	1945
Vessels inspected and passed.....	5, 653	6, 868	5, 190
Vessels granted pratique by radio.....	127	50	-----
Total.....	5, 780	6, 918	5, 190
Crew passed by quarantine.....	257, 131	340, 941	288, 503
Crew passed by radio.....	5, 986	2, 140	-----
Passengers passed at quarantine.....	68, 529	172, 556	65, 322
Passengers passed by radio.....	-----	-----	-----
Total.....	331, 646	515, 637	353, 825
Airplanes inspected and passed.....	5, 136	4, 303	3, 512
Crew of airplanes inspected and passed.....	21, 296	17, 276	13, 487
Passengers of airplanes inspected and passed.....	66, 816	57, 080	47, 473
Total.....	88, 112	74, 356	60, 960
Vessels detained in quarantine.....	1	3	2
Crew detained in quarantine on board ship.....	100	181	412
Passengers detained in quarantine on board ship.....	900	2, 148	744
Passengers admitted to hospital on account of quarantine laws.....	-----	-----	-----
Number of incoming passengers vaccinated against smallpox.....	4, 192	10, 028	-----
Number of detention days at hospital on account of quarantine laws.....	-----	-----	-----
Immigration cases admitted to station.....	3, 970	4, 636	5, 455
Number of immigration detention days.....	32, 794	35, 411	40, 156
Persons held for investigation and released.....	144	83	124
Persons deported under immigration laws.....	3, 820	5, 227	5, 831
Supplementary sanitary inspection of vessels.....	3, 405	6, 101	6, 128
Vessels fumigated.....	81	108	175

MUNICIPAL ENGINEERING

Municipal work carried on during the year included the construction and maintenance of roads, streets, and sidewalks, and the operation and maintenance of the water and sewer systems in the Canal Zone, including reservoirs, filter plants, and pump stations. The maintenance of the water system, sewer system, and the streets in the cities of Panama and Colon, and the furnishing of filtered water to these municipalities, were handled by this division. Construction work was performed and services rendered for departments and divisions of The Panama Canal, the Army, and the Navy, the government of the Republic of Panama, and for individuals and companies. Only the major items of this work are commented upon in this report.

WATER SYSTEM

Consumption of water for municipal uses and for sales to vessels during the past three fiscal years was as follows:

[Thousands of gallons]

	Fiscal year		
	1947	1946	1945
Canal Zone.....	7,026,532	7,497,466	7,822,367
City of Panama.....	3,409,194	3,556,796	3,181,981
City of Colon.....	1,278,766	1,302,426	1,307,372
Sales to vessels.....	141,182	361,685	364,165
Total.....	11,855,674	12,718,373	12,675,885

In addition to the regular maintenance work performed on the pipe lines, reservoirs, filtration plants, and pumping stations, a number of special projects were completed or were in the process of completion at the end of the fiscal year. The more important of these included the rehabilitation and relocation of the 20-inch cast-iron water line from a point west of section E, Gorgas Hospital to the Balboa pump station, Ancon (30 percent complete at the end of the year). Work was nearing completion at the end of the year on the installation of a 10-inch, low-pressure, water-line system from Balboa Road, Balboa, to Fort Amador, which project has been correlated with the proposed work of the Army at Fort Amador to permit a simultaneous change-over from a high- to a low-pressure system. The general survey of the water system which was started in November 1945 was continued during the year; the permanent maps are being brought up to date, and substantial progress was made on the program of inspecting all valves, hydrants, and meters and making the necessary repairs.

SEWER SYSTEM

In addition to the regular maintenance work performed on the Canal Zone sewer system, a revision of the drainage system south of Roosevelt Avenue between section E, Gorgas Hospital, and Mindi Street, Ancon, was completed during the year. This project involved the installation of a concrete invert with stub walls (to permit the instal-

lation of an arch culvert at a later date), the relocation of cables, extension of small existing drains, and the construction of retaining walls to protect the existing sanitary sewers.

ROADS, STREETS, AND SIDEWALKS

In addition to the ordinary maintenance work carried on during the year, a number of special replacement projects were accomplished. Two such projects started in the previous year and completed in 1947 were the paving of Roosevelt Avenue between Corozo Street and Thatcher Street, Balboa, and the reconstruction of Tivoli Avenue and Fourth of July Avenue (discussed in last year's report). Important projects started and completed during 1947 included the reconstruction of Balboa Road from section K storehouse to Fourth of July Avenue, Balboa; widening of Gaillard Highway between Diablo crossing and the Army post at Corozal; the paving of Bruja Road from Thatcher Highway to the existing concrete highway near Cocoli; and the construction of Guarapo Street in Gatun.

OTHER HEAVY CONSTRUCTION ACTIVITIES

Dredging division dock, Diablo Heights.—The dredging division dock, Diablo Heights, started in October 1944 and described in the annual reports for 1945 and 1946, was completed in 1947. The principal items of work accomplished by municipal engineering division forces during the year were the placing of 132 creosoted timber piles, 715 linear feet of creosoted fenders, 13 timber floating camels, and the pouring of 226 yards of concrete.

Sea level canal model.—A noteworthy project of 1947 was the construction of a sea level canal model for use in the investigation of means of increasing the capacity and security of the Panama Canal (Isthmian Canal Studies 1947) now being carried forward by the special engineering division. The model is a 4-inch-thick, reinforced-concrete slab representing the bottom of the proposed canal to a horizontal scale of 1 to 100, with curbs to simulate the sloping banks of the present Panama Canal. The principal work on this project consisted of constructing and installing concrete slab and curbs, constructing sumps and drains, lining ditches, installing water lines, and covering the model with corrugated metal sheets as a protection against the wind.

CITIES OF PANAMA AND COLON

Regular maintenance work was performed on the water and sewer systems during the year. Several construction and improvement projects were carried on, the more important of which were as follows: The completion of installation of a 30-inch gravity sanitary sewer and other municipal work in project known as the Lower Curundu Valley Development in Panama City; installation of sanitary sewer along proposed L Drive in the Curundu River Development (50 percent complete at the end of the fiscal year); construction of extensions to Calle 20 and Calle 21 Este Bis and Calle 27 Este, Panama City (30 percent complete at the end of the fiscal year); and the widening of Caledonia Crossing and a section of Avenida Central, south of the crossing in Panama City (completed during fiscal year).

MISCELLANEOUS ACTIVITIES

Sosa Hill quarry and rock-crushing plant.—Rock crushed during the fiscal year 1947 and sold to various departments and divisions of The Panama Canal, Panama Railroad Co., the United States Army, the United States Navy, the Republic of Panama, and to individuals and companies, totaled 84,560 cubic yards. This plant also produced 3,215 tons of asphaltic mixtures for resurfacing old roads and for the construction of new roads and streets.

Central mixing plant.—During the year 25,253 cubic yards of ready-mixed concrete were produced and sold.

Concrete-pipe plants.—The concrete-pipe plants were operated during the year and manufactured for use in construction work and for sale 3,101 feet of nonreinforced concrete pipe and 7,379 feet of reinforced concrete pipe.

PUBLIC ORDER

During the fiscal year 8,885 persons were arrested, an increase of about 2 percent in comparison with the previous year, and 15 percent in comparison with the fiscal year 1945. Statistics covering these arrests, with corresponding figures for the two previous years, are given in the following table:

	Fiscal year		
	1947	1946	1945
	<i>Persons</i>	<i>Persons</i>	<i>Persons</i>
Male.....	8,232	8,192	7,314
Female.....	653	530	421
Total.....	8,885	8,722	7,735
Arrests made with warrants.....	1,223	1,058	932
Arrests made without warrants.....	7,662	7,664	6,803
Total.....	8,885	8,722	7,735
Residents of the Canal Zone.....	2,803	2,634	2,308
Residents of Panama.....	5,701	5,344	4,878
Transients.....	381	744	549
Total.....	8,885	8,722	7,735

There were 9,417 charges filed against persons arrested during the fiscal year 1947, of which 9,056 were misdemeanors and 361 were felonies, the latter being 3.8 percent of the total offenses charged. The following were the principal causes of arrest:

Cause of arrest	Fiscal year		
	1947	1946	1945
Violation of vehicle traffic regulations.....	5,299	4,820	4,145
Littering.....	704	788	532
Trespassing.....	699	541	277
Petit larceny.....	466	521	399
Intoxication.....	295	491	351
Disturbing the peace.....	247	311	296
Battery.....	236	294	296
Fugitive from justice.....	222	254	197
Vagrancy.....	191	215	109
Enemy alien entering Canal Zone.....	3	3	3
All others.....	1,055	1,146	1,684
Total.....	9,417	9,387	8,289

Homicides.—Eight cases of homicide were investigated by the coroner during the year, four of which were the result of stabbing, two the result of gunfire, one the result of being stuck with a section of galvanized pipe, and one the result of injuries received in a fist fight.

Suicides and other investigations by coroner.—The coroner investigated eight cases of suicide during the fiscal year 1947, two of which were by drowning, one by use of firearms, one by hanging, one by lying in path of train, one by poison, and two from trauma by fall. Coroner's investigations were made in 58 other deaths during the year, of which 19 were from natural causes, 8 from accidental drowning, 11 from vehicle injuries, and the remainder from other causes.

Prisoners.—During the year the number of prisoners serving sentences in Canal Zone jails averaged 77.8 per day. All physically able prisoners were employed on useful work.

Ninety convicts were committed to the Canal Zone penitentiary, an increase of 16 as compared with the preceding year. Sentences imposed on these convicts totaled 155 years. Seventy-four convicts were discharged, leaving 117 in custody at the end of the year. Computed at standard rates of pay for common labor the value of the labor performed by convicts during the year amounted to \$62,092. Of this amount, 24 percent represented the value of work performed in the operation, maintenance, and improvement of the penitentiary buildings and grounds; 60 percent on the penitentiary farm, and the remaining 16 percent on outside municipal work.

Deportations.—By order of the Governor, 28 persons were deported from the Canal Zone during the fiscal year, of whom 23 were convicts who had served sentences in the penitentiary and 5 were persons whose continued residence in the Canal Zone was regarded as undesirable.

TRAFFIC ACCIDENTS AND CONTROL

There were 778 traffic accidents reported during the year, or an average of 65 per month, compared with an average of 64 per month during the previous year. These accidents resulted in the deaths of 11 persons and injuries to 295 other persons. Following is a classification of the causes of these accidents for the past three fiscal years:

Cause	Fiscal year		
	1947	1946	1945
Negligent driving.....	531	516	404
Reckless driving.....	68	71	92
Careless pedestrian.....	55	62	47
Intoxicated driver.....	24	33	29
Defective vehicle.....	30	28	24
Careless passengers.....	12	9	4
Inexperienced driver.....	11	8	9
All others.....	47	43	29
Total.....	778	770	638

MAGISTRATES' COURTS

The following is a summary of business transacted at the magistrates' courts for the subdivisions of Cristobal and Balboa for the fiscal year 1947, together with comparative figures for the fiscal year 1946:

	Cristobal		Balboa		Total	
	1947	1946	1947	1946	1947	1946
Cases handled:						
Criminal.....	2,512	3,058	6,087	5,488	8,599	8,546
Civil.....	6	12	12	19	18	31
Total.....	2,518	3,070	6,099	5,507	8,617	8,577
Disposition of criminal cases:						
Conviction.....	2,248	2,827	5,615	5,085	7,863	7,912
Acquittal.....	131	98	211	178	342	276
Dismissal.....	80	102	115	96	195	198
Held for district court.....	53	61	146	125	199	186
Total.....	2,512	3,088	6,087	5,484	8,599	8,572
Convictions in which execution of sentences was suspended and defendants placed on probation.....	105	70	255	174	360	244
Rearrested for violating terms of probation.....	6	13	7	10	13	23
Revenues.....	\$25,023	\$25,508	\$38,383	\$30,361	\$63,406	\$55,869

PARDONS AND REPRIEVES

The pardon board, consisting of five members appointed by the Governor, acts in an advisory capacity in the consideration of requests submitted by prisoners for executive clemency. During the past year the board submitted recommendations to the Governor on 79 applications for executive clemency, 67 of which were for commutation of penitentiary and jail sentences and 12 for revocation of orders deporting persons following service of sentences of imprisonment. The Governor extended clemency in 16 of these cases.

On February 14, 1947, Col. Samuel D. Avery, U. S. A., was appointed to the pardon board, replacing Col. H. C. Dooling, U. S. A., following the expiration of his tour of duty with The Panama Canal. During the year, five alternate members were appointed to the board.

FIRE PROTECTION

During the year 315 fires, 55 false alarms, and 13 emergency calls were reported. The following table classifies the owners who suffered property losses during the year, as compared with the previous year:

	Fiscal year 1947		Fiscal year 1946	
	Number of fires	Property loss	Number of fires	Property loss
The Panama Canal.....	226	\$35,509	214	\$18,646
Panama Railroad Co.....	20	8,380	40	602
U. S. Army.....	12	10,112	23	126,057
U. S. Navy.....	6	50,115	12	86,105
Private (including ships).....	51	196,493	47	259,140
Total.....	315	300,609	336	490,550
Total property involved.....		16,509,929		14,675,769

The most serious fire of the year occurred on January 15, 1947, in a 12-family frame residence building at Gatun. Two brothers, 8 and 2 years old, were discovered dead in one of the apartments, apparently beyond all help before the arrival of the first apparatus. The cause of the fire was never determined. Value of the property involved was estimated at \$62,970, while losses including both Panama Canal and private, were estimated at \$39,259.

PUBLIC SCHOOL SYSTEM

The public school system for white children includes eight kindergartens; nine elementary schools, grades 1 through 6; two junior high schools, grades 7 and 8; two senior high schools, grades 9 through 12; an apprentice school; and a junior college. Public schools for colored children include six kindergartens, eight elementary schools, grades 1 through 6; five 3-year junior high schools, grades 7 through 9; two occupational high schools, grades 10 through 12; and a 2-year normal training school.

The schools for white children operate on a 9-month basis and February enrollments are used for purposes of comparison, since they usually represent the enrollment peaks. In February 1947, 3,883 pupils were enrolled in the white elementary and secondary schools, as compared with 3,357 in February 1946. The white kindergarten enrollments were 395 in February 1947, as compared with 281 in February 1946.

For the past 3 years the average daily attendance has been as follows:

	Fiscal year		
	1947	1946	1945
White schools (see note).....	3, 625	3, 130	2, 881
Colored schools.....	2, 791	2, 626	1 2, 606

¹ Corrected figure.

NOTE.—Junior College and kindergarten not included.

There was a large increase in the enrollments in the Canal Zone Junior College over those of the preceding year. The April enrollments of regular and special daytime students numbered 186, compared with 85 in April of the previous year. The increase in enrollments was partly due to the reduction in tuition rates. Effective September 1946 tuition was reduced from \$180 to \$50 per year for children of government employees stationed on the Isthmus and from \$200 to \$100 per year for children of American citizens who are not employees of the government. Tuition remained at \$225 per year for students not falling into either one of these categories. An important cause of the increased enrollments, however, was the difficulty many Canal Zone students encountered in gaining admission to colleges in the United States and who, therefore, entered the Canal Zone Junior College. The enrollment in the extension division of the Junior College (which is in addition to that of regular and special daytime students) was increased from 222 in April of 1946 to 325 in April 1947.

The apprentice-learner school was reopened in October 1946 after having been closed for 2 years during the war. The program was adjusted to meet the needs of newly appointed apprentices, veterans returning to their apprenticeships after interruptions due to military service, and men who had been promoted to journeyman status before the completion of their apprenticeships because of wartime activities.

During the school year the white schools, not including the apprentice school, were in session 177 days and the colored schools 199 days. At the close of school in June 1947, 156 white teachers, including 8 junior college instructors and 6 white supervising teachers in the colored schools, and 118 colored teachers were in regular employment in these schools.

Canal Zone white children continued to achieve above, and colored children below, United States norms provided for the standard tests used in the schools. On the basis of standard achievement tests administered the average eighth grade white pupil was 9 months above, and the average colored pupil was 1 year and 1 month below the United States norms.

In the white high schools the median pupil scored at the sixty-seventh percentile on United States norms provided for the tests, whereas in 1946 the median Canal Zone white high school pupil scored on the seventy-third percentile.

Dr. Paul R. Hanna of Stanford University, a leader in the field of curriculum, spent 6 weeks on the Isthmus as a consultant. He reported on the procedures being followed in several school systems in the United States for curricular development, and outlined a program which could be followed in the Canal Zone. In order to further cooperative thinking between the administration and the faculty a curriculum cabinet will be established to be composed of the administration and representative teachers, and also four curriculum councils—two from the white schools and two from the colored schools.

Work was begun on a plan to provide additional training for high-school students who are deficient in reading skill. A study was made of the reading ability of the high-school students in order to determine which students need additional instruction. Instructional material was selected and the program made ready to operate in the fall of 1947.

Occupational high schools for colored students were opened at La Boca and Silver City. The curricula developed for these schools were based upon a careful study of the positions which might be available to graduates with The Panama Canal and Panama Railroad Co., other United States Government agencies on the Isthmus, or in private employment in the Republic of Panama. Grade 10, the first grade of a 3-year course, was opened in August 1946. Shop buildings, the first units of the new occupational high-school plants, were completed during the fiscal year 1947 and are now partially equipped and in operation. It is anticipated that classroom buildings for offering related vocational and general education will be ready for occupancy in November 1947. The buildings will complete the plant required for grade 11, to be added in August 1947, and grade 12, which will be added in August 1948. In February 1947 there were 243 students enrolled in the occupational high schools.

Physical education classes for both white and colored pupils are conducted by the personnel of the physical education and recreation section. In addition, personnel from this section provides leadership and guidance for the Boy and Girl Scout organizations on the Isthmus and supervises such sports and recreational activities as baseball, basketball, handball, football, tennis, boxing, fencing, archery, athletic meets, swimming, and water safety. Construction of the addition to the Balboa Gymnasium, begun in June 1946, is expected to be completed by August 1, 1947.

POSTAL SYSTEM

Twenty-four post offices were in operation by the bureau of posts at the beginning of the year, but 1 post office (Upham) was closed in November, leaving 23 post offices in operation at the close of the year. The bureau of posts continued to handle closed transit mails from the United States to Central and South American countries.

Operations for the past 3 years are summarized in the following table:

	Fiscal year		
	1947	1946	1945
Receipts:			
Sale of air-mail postage.....	\$441,696	\$366,673	\$262,729
Sale of other postage stamps, postal cards, stamp books, etc.....	206,526	198,929	98,263
Money-order fees.....	42,770	32,512	28,583
Box rents collected.....	35,287	32,252	31,076
Handling mail—other agencies.....	12,300	14,090	24,394
Other receipts.....	1,317	1,524	2,475
Total receipts.....	739,896	645,980	447,520
Expenses:			
Transportation charges for air mail.....	210,026	181,323	151,290
All other charges and expenses.....	630,334	382,403	325,430
Total expenses.....	840,360	563,726	476,729
Net surplus (deficit).....	(100,464)	82,254	(29,200)
Transferred from postal savings interest account.....			100,000
Reported surplus (deficit).....	¹ (100,464)	82,254	70,800

¹ Reserve funds are available to absorb this deficit.

The deficit of \$100,464 for 1947 recorded in the above table was caused principally by a decrease in air-mail rates. The rate to the United States was reduced from 10 cents per half ounce to 5 cents per ounce on October 1, 1946, and reductions were made in rates on mail for foreign destinations routed via the United States in order to conform to the United States rate plus the rate from the Canal Zone to the United States. With the adoption of the 5-cent rate to the United States the 6-cent military rate was automatically canceled. The rates to Central and South American countries and points in the Caribbean area were reduced to 10 cents per half ounce. Transportation rates on air mail to the United States were reduced from \$2.15 per pound to \$0.75 per pound, with corresponding reductions in rates on mail for foreign destinations.

Statistics relative to the operation of the Canal Zone postal system for the past three fiscal years are covered in the following table:

	Fiscal year		
	1947	1946	1945
Registered and insured articles dispatched:			
Official letters and parcels registered free.....	69,750	61,694	56,182
Foreign registered letters.....	26,309	39,574	26,443
Foreign registered parcels.....	335	625	174
Domestic registered letters.....	38,807	30,377	25,745
Domestic registered parcels.....	1,491	509	301
Insured parcels.....	57,569	35,501	10,840
Total registered and insured articles dispatched.....	194,261	168,280	119,685
Registered and insured articles received:			
Registered articles.....	127,113	105,283	79,874
Insured parcels.....	69,183	50,310	48,298
Foreign parcel post.....	3,022	2,617	1,956
Total registered and insured articles received.....	199,318	158,210	130,128
Dispatches of mail by steamer—Cristobal:			
To the United States.....	498	124	130
To foreign countries.....	1,735	723	814
Total dispatches sent.....	2,233	847	944
Receipts of mail by steamer—Cristobal:			
From the United States.....	191	167	147
From foreign countries.....	1,477	482	489
Total dispatches received.....	1,668	649	636
Dispatches of mail by steamer—Balboa:			
Total made.....	957	953	909
Total received.....	825	811	928
Dispatches of mail by air—Balboa:			
Total made.....	19,924	17,743	14,431
Total received.....	20,478	16,381	14,709

IMMIGRATION VISAS

During the fiscal year, 229 visas were issued by the executive secretary to alien residents of the Canal Zone traveling to the United States. Of these, 17 were quota immigration visas, 116 were non-quota immigration visas, 62 were nonimmigrant visas, and 34 were transit certificates. Fees collected for visas amounted to \$1,367.

RELATIONS WITH THE REPUBLIC OF PANAMA

During the year, correspondence and discussions were conducted between the Governments of the Canal Zone and the Republic of Panama with reference to various matters of local joint interest arising from the relations of the two Governments and the proximity of their respective areas. The matters handled were generally of a routine nature, dealing with customs, immigration, municipal improvements, public health, postal service, repatriation of aliens, and vital statistics.

CUSTOMS

During the war years the bureau of customs assumed the duties of enforcement in the Canal Zone of wartime restrictions placed upon travel and the movement of cargo, mail, and currency, which, in the United States, were handled by the Department of Treasury and

Customs. All emergency operations have now been discontinued except export control, which has been extended until March 1, 1948.

The following is a statistical summary of the more important items handled by the Customs during the past fiscal year, with corresponding figures for the two preceding years:

Item	Fiscal year		
	1947	1946	1945
Vessels entered.....	10, 574	12, 592	9, 058
Vessels cleared.....	10, 557	12, 538	9, 033
Aircraft entered.....	5, 123	3, 899	3, 080
Aircraft cleared.....	5, 120	3, 897	3, 076
Customs releases on shipments consigned to Panama.....	6, 420	5, 793	4, 514
Shipments of household goods of employees, inspected and sealed for shipment to United States.....	68	43	93
Invoices certified for shipment to United States.....	1, 061	949	2, 092
Chinese passengers arriving.....	14	68	87
Chinese admitted to Panama.....	7	46	78
Vessels with Chinese crews checked.....	682	616	442

SHIPPING COMMISSIONER

The shipping commissioner and his deputies have the same authority with respect to United States seamen as shipping commissioners in United States ports and United States consuls in foreign ports. During the fiscal year, 1,271 seamen were shipped in vessels of the United States and 929 were discharged. No sick or destitute seamen were returned to the United States at the expense of the appropriation for relief of destitute American seamen, but 151 were signed on vessels as workaways, and returned to the United States without expense to the Government.

The total wages earned by seamen who were discharged at Canal Zone ports amounted to \$313,419, and the total approved for deductions on account of advances, allotments, fines, slop-chest account, etc., was \$123,744. The balance of \$189,675 was either paid to seamen under the supervision of the deputy shipping commissioners or received on deposit for the seamen by the deputy shipping commissioners. The wages, money, and effects of six American seamen, three of whom died in the Canal Zone and three at sea, were handled by the shipping commissioner during the year. Their personal effects and cash, amounting to \$493, were remitted to the proper courts for disposition.

ADMINISTRATION OF ESTATES

The public administrator takes charge of all estates requiring administration within the Canal Zone that are not handled by others legally entitled to administer them. In the case of estates with total assets exceeding \$1,000 in value, the public administrator charges the regular commissions fixed by law, which are paid into the Treasury of the United States. Commissions amounting to \$2,472 were collected during the fiscal year. The estates of 224 deceased or insane persons, with cash assets of \$77,560 were settled during the fiscal year.

FOREIGN CORPORATIONS

Foreign corporations doing business in the Canal Zone are required to have licenses, and 108 such corporations, the majority of which were steamship lines, steamship agencies, and Government contractors, were licensed during the fiscal year 1947. Fees amounting to \$1,080 were collected.

INSURANCE

The license fee for insurance companies doing business in the Canal Zone is \$10 per year plus a tax of $1\frac{1}{2}$ percent on premiums collected. At the end of the fiscal year 22 insurance companies were licensed to write insurance in the Canal Zone.

Life-insurance companies reported that as of December 31, 1945, a total of 1,769 policies was in force. During the calendar year 1946, 115 policies were issued and 110 canceled, leaving 1,774, with an aggregate face value of \$6,671,462 in force as of December 31, 1946. Premium collections on life-insurance policies during the calendar year 1946 totaled \$187,865. Claims settled during the year totaled \$23,222.

During the calendar year 1946 the premiums received by miscellaneous insurance companies, including accident, automobile liability, fire, surety, fidelity, etc., but excluding life insurance, amounted to \$205,828. Losses paid during the year totaled \$143,709.

The tax of $1\frac{1}{2}$ percent on premiums collected by all classes of insurance companies amounted to \$6,718 for the calendar year 1946, as compared with \$6,984 during the previous year.

LICENSES

The number of motor vehicle licenses and transfers issued during each of the past three fiscal years and the aggregate fees collected therefor are summarized below. These include licenses for official vehicles for which no charge is made:

	Fiscal year		
	1947	1946	1945
Vehicle licenses issued.....	22,007	16,685	16,469
Motor vehicle transfers.....	6,940	6,079	5,458
Total.....	28,947	22,764	21,927
Fees collected.....	\$118,166	\$100,374	\$91,844

In addition to the vehicle licenses covered above, several other types of licenses were issued, such as chauffeurs' licenses, peddler licenses, etc.

SELECTIVE SERVICE REGISTRATION

Selective Service registration was terminated by law at noon March 31, 1947, at which time 3,425 male citizens of the United States between the ages of 18 and 44, inclusive, had been registered in the Canal Zone since the beginning of registration November 16, 1943, under the provisions of Presidential proclamation dated October 26, 1943.

F. H. Wang, executive secretary of The Panama Canal, served as chief registrar for the Canal Zone throughout the registration period under appointment by the National Director of Selective Service.

No local board of the Selective Service System was established in the Canal Zone. Registrants residing in the Canal Zone were under the jurisdiction of the local board in the United States having jurisdiction over their permanent home addresses in the United States; registrants having no such permanent home addresses came under the jurisdiction of local board No. 1 (foreign), Washington, D. C.

COMMERCIAL AVIATION

Commercial aviation activities remained centered on the Pacific side of the Isthmus at the Canal Zone air terminal. The expansion of commercial aviation which followed the end of the recent war was continued throughout the first half of the fiscal year. All companies using the Canal Zone air terminal were highly active in introducing new type of aircraft, training additional operational personnel, and preparing for night flying in this area. By mid-year there was no longer the large backlog of passengers and express that had persisted at Balboa throughout the war years.

During the fiscal year three new foreign air carriers and one new United States air carrier were certified to operate within the Canal Zone on a scheduled basis.

In the first month of the fiscal year Albrook Field was opened to commercial aviation on a round-the-clock basis. Shortly afterward one existing foreign carrier and one existing United States carrier qualified and initiated scheduled operation to and from the Canal Zone on a 24-hour basis.

Tabulated below is a statistical summary of commercial aviation activities in the Canal Zone for the fiscal year 1947, as compared with the two previous years:

NUMBER OF PASSENGERS CARRIED BY REGULARLY SCHEDULED AIRLINES

	Fiscal year		
	1947	1946	1945
Incoming.....	68,743	57,493	44,432
Outgoing.....	71,912	54,667	45,584
Total.....	140,655	112,160	90,016

AIR EXPRESS AND MAIL ¹

[Thousands of pounds]

Entered.....	3,114	2,485	2,203
Cleared.....	2,846	2,109	1,915
Total.....	5,960	4,595	4,118

NUMBER OF AIRCRAFT ENTERED AND CLEARED

Entered.....	5,123	3,953	3,081
Cleared.....	5,120	3,951	3,076

¹ Includes transshipped cargo which entered and cleared; excludes weight of transfer mail which does not reach or pass through Canal Zone post offices.

SECTION V

FINANCIAL AND STATISTICAL STATEMENTS

Financial statements of major interest relative to the operation of The Panama Canal are presented in this section. These statements are abstracted from the annual report of the accounting department of The Panama Canal.

ACCOUNTING SYSTEM

Accounts are maintained in accordance with statutory rules and regulations and accepted principles of appropriation and fund accounting prescribed for governmental bodies. However, the activities being of a quasi-business nature, the accounting system has been adapted to conform as nearly as practicable to the principles and practices approved by the Interstate Commerce Commission and State boards regulating public utilities as well as to procedure followed by comparable industries in the corporate field.

For purposes of evaluating the investment, the close of the construction and development period of the Panama Canal was fixed as July 12, 1920, the date on which the Canal was formally declared open to commercial traffic by Presidential proclamation.

Considered as properly chargeable to construction costs and so reflected in the capital investment account are interest amounting to \$128,991,063 on United States Treasury funds advanced up to July 12, 1920, and the treaty payments to the Republic of Panama consisting of a \$10,000,000 payment in 1904 and annual payments of \$250,000, totaling \$2,000,000 for the period 1913-20. Subsequent annual payments are reflected in the operating accounts. A provision in the treaty of 1936 with the Republic of Panama increased the annual payment to \$430,000 retroactive to 1934.

Subsequent to the fiscal year 1920, a potential capital interest return of 3 percent has been considered as an unrecorded charge to expenses in determining computed surplus or deficit, while net revenues before interest charges have been used to calculate the actual rate of return on net capital investment.

Based on the foregoing, the gross capital investment at the beginning of the fiscal year 1947 was \$712,220,469.37, which, after deducting depreciation of \$51,324,670.87 and Canal defense property and additional facilities (third locks) amounting to \$144,970,087.12, leaves a net capital investment of \$515,925,711.38. For the fiscal year 1947 there was a net deficit of \$321,951.19 from operations of the Canal and a net revenue of \$1,142,341.02 from business operations, or a combined net revenue of \$820,389.83.

OPERATIONS OF PANAMA RAILROAD CO.

The results from the operations of the Panama Railroad Co.'s various business units on the Isthmus are shown in detail in the accounts of the Panama Railroad Co. The detailed statement of revenues, expenses, and statistics for all railroad industries, changes in the capital account, and the results from operations of the steamship line appear in the annual report of the Panama Railroad Co. A review of these activities is presented in section II of this report under the heading "Business operations under the Panama Railroad Co."

PANAMA CANAL OPERATIONS

The major financial results of Panama Canal operations are presented hereinafter in tables 1 to 28, with supplementary comments and explanations.

The complete report for the accounting department, including tables and reports not printed herein because they are concerned principally with details of operations which lack general interest, is on file at the office of the Governor and at the Washington Office of The Panama Canal.

INDEX TO TABLES

Table

No.

1. General balance sheet.
2. Canal general property.
3. Floating plant.
4. Business fixed property.
5. Business equipment.
6. Capital assets, depreciable and nondepreciable.
7. Public works in cities of Panama and Colon.
8. Receipts and disbursements, appropriated funds.
9. Receipts and disbursements, custodial funds.
10. Accounts receivable.
11. Materials and supplies.
12. Work in progress.
13. Deferred charges.
14. Capital investment.
15. Accounts payable.
16. Depreciation reserves.
17. Reserve for repairs.
18. Reserve for leave.
19. Deferred credits.
20. Consolidated statement of income, expenses, and net revenues.
21. Revenues, expenses, and computed surplus.
22. Capital refundments.
23. Balance of revenues and refundments.

Details of Operation for Profit and Loss

(Summaries on tables 20 and 21)

24. Canal revenues.
25. Canal earnings and expenses.
26. Business expenses, revenues, and profit or loss.

Miscellaneous

27. Balances in appropriations and funds.
28. Funded reserves.

TABLE NO. 1.—General balance sheet, June 30, 1947

ASSETS

Capital Assets:

Canal general property (table No. 2).....	\$502, 188, 371. 09
Floating plant (table No. 3).....	9, 865, 620. 80
Canal defense property.....	69, 827, 854. 68
Additional facilities.....	78, 798, 039. 02
Business fixed property (table No. 4).....	45, 780, 187. 80
Business equipment (table No. 5).....	5, 226, 035. 73

Total capital assets (table No. 6)..... \$711, 686, 109. 12

Custodial funds:

Special deposit funds:

Clubhouse funds.....	\$1, 880, 885. 01
Money-order funds.....	10, 825, 560. 69
Security deposit funds.....	2, 301, 449. 78

Total special deposit funds (see
contra).....

15, 007, 895. 48

Revenue due U. S. Treasury..... 291, 251. 57

Total custodial funds (table No. 9)..... 15, 299, 147. 05

Working Assets:

Appropriated funds:

With U. S. Treasury.....	\$9, 549, 165. 03
With fiscal officers.....	5, 863, 691. 71

Total appropriated funds (table
No. 8).....

15, 412, 856. 74

Accounts receivable (table No. 10)..... \$2, 010, 630. 76

Stores (table No. 11)..... 11, 185, 145. 61

Work in progress (table No. 12)..... 531, 466. 55

Total working assets.....

13, 727, 242. 92

Deferred charges (table No. 13)..... 2, 013, 027. 25

Total assets.....

758, 138, 383. 08

LIABILITIES

Capital Investment:

Net appropriations by Congress..... \$589, 705, 901. 12

Interest during construction..... 128, 991, 063. 00

Total capital investment (table No.
14).....

718, 696, 964. 12

Special deposit accounts (see contra).....

15, 007, 895. 48

Accounts payable (table No. 15)..... 3, 320, 412. 60

Reserve for repairs (table No. 17)..... 564, 999. 99

Reserve for leave (table No. 18)..... 984, 235. 70

Deferred credits (table No. 19)..... 4, 078, 916. 28

Revenues and refundments:

Net revenues to June 30, 1946..... \$269, 775, 622. 66

Operating profit, fiscal year 1947 (table
No. 20)..... 820, 389. 83

Additional amount for prior fiscal years
(table No. 26)..... 583, 938. 42

Total net revenues (table No. 21)..... 271, 179, 950. 91

Canal depreciation (table No. 16)..... 30, 382, 601. 89

Plant depreciation (table No. 16)..... 23, 356, 140. 30

Total..... 324, 918, 693. 10

Less capital refundments (table No. 22) 309, 433, 734. 19

Balance, revenues and refundments (table No. 23)..... 15, 484, 958. 91

Total liabilities..... 758, 138, 383. 08

The terms and arrangement of the foregoing balance sheet follow closely the generally accepted principles of corporate accounting, except as to the last item "Revenues and refundments." The statutes require that receipts for tolls, civil revenues, and net profits on business operations shall be covered into the United States Treasury and relinquished from control of The Panama Canal.

Funds for current operating expenses and capital construction are appropriated by the Congress, and for accounting purposes are considered as provided from the tolls and other receipts covered into the Treasury. Practically all receipts other than those cited above are repayable to Canal appropriations and may be reexpended, but as the Canal is deprived of tolls revenue, its principal source of income, the reexpendable receipts are insufficient to provide for operation and maintenance, thus requiring the Canal to submit its expenditure program annually to the Congress.

Total net revenues, appearing under the caption "Revenues and refundments," represent the accumulated operating earnings of The Panama Canal before capital interest charges. This net revenue, however, has been covered into the United States Treasury in the form of tolls and other receipts. It therefore follows that net capital refundments and net revenues earned will always be approximately the same, except for the fluctuation of unexpended appropriated cash and other working capital items.

These various fund requirements leave The Panama Canal balance sheet without an equivalent for the usual corporate "Surplus account," since any surplus is included in the tolls covered into the Treasury by law. However, the equivalent for "Surplus account" is shown on table No. 21, which compares "Total net revenues" of \$271,179,950.91, appearing on the balance sheet, with the computed interest on the net capital investment, by fiscal years, beginning with 1921, but no interest charge against the Canal is actually made by the United States Treasury.

TABLE NO. 2.—*Canal general property, fiscal year 1947*

	Balance, July 1, 1946	Additions and transfers	Retire- ments and transfers	Balance, June 30, 1947
Channels, harbors, and basins:				
Balboa to Pedro Miguel.....	\$24,309,928.86			\$24,309,928.86
Pedro Miguel to Gatun.....	113,466,691.77			113,466,691.77
Gatun to Cristobal.....	12,829,445.51			12,829,445.51
Breakwaters:				
Naos Island.....	1,075,874.10			1,075,874.10
Colon:				
East.....	3,994,727.10			3,994,727.10
West.....	4,528,829.57			4,528,829.57
Locks:				
Miraflores.....	24,683,045.33			24,758,987.50
Storehouse building 3 (sold).....			\$1,636.37	
Toilet and locker facilities.....		\$12,598.38		
General buildings and structures, building 7.....		37,980.16		
Pedro Miguel.....	16,815,423.16			16,863,468.95
General buildings and structures, building 6.....		38,311.16		
Toilet and locker facilities.....		9,734.63		
Gatun.....	37,961,773.06			38,013,669.55
Toilet and locker facilities.....		51,896.49		
Floating caisson.....	347,868.15			347,868.15
Towing locomotives.....	1,512,691.56			1,575,786.51
Construct 6 locomotives.....		63,094.95		

TABLE NO. 2.—*Canal general property, fiscal year 1947—Continued*

	Balance, July 1, 1946	Additions and transfers	Retiro- ments and transfers	Balance, June 30, 1947
Dams:				
Miraflores.....	\$1,228,561.63	-----	-----	\$1,228,561.63
Pedro Miguel.....	457,302.32	-----	-----	457,302.32
Madden.....	9,773,003.98	-----	-----	9,773,003.98
Gatun.....	10,475,943.56	-----	-----	10,475,943.56
Gatun-Mindí Levee.....	148,974.22	-----	-----	148,974.22
Spillways:				
Miraflores.....	1,398,684.94	-----	-----	1,398,684.94
Gatun.....	4,323,538.02	-----	-----	4,323,538.02
Aids to navigation:				
Channel aids.....	627,656.80	-----	-----	627,656.80
Transit aids.....	24,191.04	-----	-----	24,191.04
Coastal aids.....	175,069.78	-----	-----	175,069.78
Lighthouse depot, Gatun.....	204,061.81	-----	-----	204,061.81
Wharves and piers:				
Balboa (Nos. 14 to 19).....	4,778,492.50	-----	-----	4,909,593.31
Construct dock, dredging division.....	-----	\$131,100.81	-----	-----
Gamboa.....	295,430.46	-----	-----	295,430.46
Cristobal (Nos. 6, 13, 14, and 15).....	3,627,061.82	-----	-----	3,627,061.82
Dry docks:				
Balboa.....	3,647,426.98	-----	-----	3,647,597.34
Sewage disposal system.....	-----	170.36	-----	-----
Cristobal.....	672,437.70	-----	-----	672,437.70
Coaling plants:				
Balboa.....	2,034,568.35	-----	-----	1,970,551.35
2 berm cranes (demolished).....	-----	-----	\$64,017.00	-----
Cristobal.....	3,592,797.59	-----	-----	3,324,072.29
Reloaders (demolished).....	-----	-----	114,854.00	-----
Reclaiming bridge (demolished).....	-----	-----	153,871.30	-----
Dredging division plant.....	984,705.16	-----	-----	984,705.16
Ferry plants:				
Thatcher ferry plant.....	1,168,601.38	-----	-----	1,168,601.38
Miraflores ferry plant (retired).....	66,242.15	-----	66,242.15	-----
Titles and treaty rights:				
Purchase price, New Panama Canal Co., 1904.....	131,717,335.97	-----	-----	131,717,335.97
Treaty payment to Republic of Panama, 1904.....	10,000,000.00	-----	-----	10,000,000.00
Annual treaty payments to Republic of Panama, 1913-20.....	2,000,000.00	-----	-----	2,000,000.00
Relocation of Panama Railroad.....	9,800,626.46	-----	-----	9,800,626.46
Reequipment of Panama Railroad.....	3,247,332.11	-----	-----	3,247,332.11
Depopulation, Canal Zone.....	2,701,016.24	-----	-----	2,701,016.24
General buildings and structures:				
Office buildings.....	2,139,263.89	-----	-----	2,139,263.89
Other buildings and structures.....	582,472.07	-----	-----	486,998.71
Buildings 6 and 7 (to locks).....	-----	-----	76,291.32	-----
Building 26, Gatun, alterations (retired).....	-----	-----	18,955.28	-----
D. Q. M. office, Paraiso, alterations (retired).....	-----	-----	124.58	-----
D. Q. M. paint shop, Paraiso, alterations (retired).....	-----	-----	102.18	-----
Health department buildings and structures:				
Gorgas Hospital.....	2,231,003.50	-----	-----	2,231,620.71
Designs and studies for postwar construction:				
Clinic, admitting office, and auditorium.....	-----	472.63	-----	-----
Construct steam plant.....	-----	144.58	-----	-----
Colon Hospital.....	781,201.46	-----	-----	760,601.12
Abandoned projects written off:				
Ward and clinic buildings.....	-----	-----	23,548.81	-----
Steam plant.....	-----	-----	3,290.14	-----
Service building.....	-----	-----	2,025.71	-----
Kitchen extension.....	-----	-----	10,667.80	-----
Construct chapel building.....	-----	8,263.99	-----	-----
Reroof wards 4 and 5.....	-----	4,711.79	-----	-----
Replace water pipe.....	-----	3,686.56	-----	-----
Construct utility shed.....	-----	1,270.85	-----	-----
Fence hospital area.....	-----	750.00	-----	-----
Alter pavilion A.....	-----	248.73	-----	-----
Margarita Hospital.....	401,394.54	-----	-----	401,196.46
Addition (adjustment).....	-----	-----	198.08	-----
Corozal Hospital.....	760,065.83	-----	-----	760,065.83
Palo Seco Leprosarium.....	190,551.16	-----	-----	190,551.16

¹ Original purchase price of \$40,000,000, less Panama Railroad Company capital stock, and sales and transfers of property acquired.

TABLE NO. 2.—*Canal general property, fiscal year 1947—Continued*

	Balance, July 1, 1946	Additions and transfers	Retire- ments and transfers	Balance, June 30, 1947
Health department buildings and structures—Continued.				
Dispensaries	\$387,144.60			\$387,799.13
La Boca: Construct silver dispensary (adjustment)			\$154.71	
Red Tank: Construct silver dispensary		\$809.24		
Quarantine stations	65,780.35			65,839.97
Designs and studies, postwar construction:				
Barracks for Americans		32.87		
Guardhouse		26.75		
Other buildings and structures	118,420.87			118,690.93
Mt. Hope: Construct office building, cemetery		270.06		
Civic buildings and structures:				
Schoolhouses	2,860,145.26			3,374,636.86
Balboa: Designs and studies, postwar construction: Auditorium, high school, and junior college		55.77		
La Boca:				
Construct silver high school		153,936.21		
Construct silver vocational school		46,558.67		
Designs and studies, postwar construction: Silver high school		12,338.78		
Gamboa: Addition, gold elementary school		4,481.36		
Silver City:				
Construct elementary school		66,103.60		
Construct Silver high school		115,296.26		
Construct Silver vocational school		107,196.40		
Designs and studies, postwar construction: Silver high school		8,524.55		
Recreational structures	289,095.72			472,002.23
Balboa: Construct gymnasium addition		182,906.51		
Police stations	289,007.98			289,007.98
Prisons	79,899.37			79,899.37
Fire stations	121,901.95			121,749.77
Paraiso: Fire-truck house alteration (retired)			152.18	
Courthouses	187,732.73			187,732.73
Post offices	238,468.34			238,468.34
Other buildings and structures	44,440.81			35,839.12
Balboa building 45 (sold)			8,601.69	
Permanent town sites	2,360,692.07			2,512,023.39
Ancon		17,250.44		
Balboa		3,987.10		
Diablo		54,248.05		
La Boca		695.49		
Miraflores		185.70		
Pedro Miguel		149.91		
Corozal		100.41		
Red Tank		198.64		
Paraiso		301.69		
Gamboa		4.05		
Gatun		265.72		
Camp Coiner		15,212.99		
Margarita		19,984.62		
Silver City		38,351.05		
Colon		349.85	177.10	
Mount Hope		222.71		
Roads, streets, and sidewalks	5,944,263.05			6,404,541.80
Ancon		93,238.15		
Balboa		203,785.36		
Diablo		27,077.11		
Corozal		550.84		
Gatun		68,032.09		
Mount Hope		30,000.00		
Margarita		23,390.33		
Mindi		3,560.73		
Silver City		1,880.33		
Camp Bierd		348.23		
Camp Coiner		8,418.15		
Colon			2.57	

TABLE NO. 2.—*Canal general property, fiscal year 1947—Continued*

	Balance, July 1, 1946	Additions and transfers	Retire- ments and transfers	Balance, June 30, 1947
Sewer system	\$971,885.22			\$1,003,147.59
Sewage disposal studies:				
Consultants		\$1,048.65		
Pacific side, general		421.27		
Atlantic side, general		548.59		
Ancon		5,082.20		
Balboa		359.54		
La Boca		1,521.79		
Miraflores		5,089.23		
Gatun		289.56		
Margarita		4,806.90		
Camp Colner		11,838.70		
Silver City		509.43		
Colon			\$313.49	
Street lighting	253,448.90			267,003.74
Ancon		3,226.14		
La Boca		724.85		
Margarita		2,748.55		
Camp Bird		5,602.12		
Silver City		1,255.07		
Colon			1.89	
Interest during construction	128,991,063.90			128,991,063.00
Total, Canal general property	500,986,703.81	1,749,895.43	548,228.15	502,188,371.09
Canal defense property	68,980,089.98	847,764.70		69,827,854.68
Construction, additional facilities	75,989,997.14			78,798,039.02
Third set locks			101,130.23	
Isthmian Canal studies, 1947		2,909,172.11		

Due to reclassification of accounts effective July 1, 1946, all Canal general property, formerly listed as "General buildings and structures," is now classified under three groups, as follows: "General buildings and structures," "Health department buildings and structures," and "Civic buildings and structures."

Due to this regrouping, the sequence of certain items in the foregoing table does not coincide with that shown on similar table in report for fiscal year 1946. Total values, of course, have not been affected by the revised sequence.

TABLE NO. 3.—*Floating plant, fiscal year 1947*

	Balance, July 1, 1946	Additions and transfers	Retire- ments and transfers	Balance, June 30, 1947
Tugs and crane boats	\$3,011,583.32			\$3,011,583.32
Launches	929,060.04			940,552.64
New construction: <i>Quail</i>		\$26,782.24		
Surveyed: <i>Toucan</i>			\$15,289.64	
Dredges	2,600,914.92			2,578,411.92
<i>Cascadas</i> , boilers surveyed			22,500.00	
Dump scows	1,583,332.51			1,583,332.51
Machine barges	1,251,686.30			1,251,686.30
Lighters	440,977.36			440,977.36
Launch repair barges	27,763.78			27,763.78
Anchor barge	31,312.97			31,312.97
Total, floating plant	9,876,628.20	26,782.24	37,789.64	9,865,620.80

TABLE NO. 4.—*Business fixed property, fiscal year 1947*

	Balance, July 1, 1946	Additions and transfers	Retire- ments and transfers	Balance, June 30, 1947
Hydroelectric plant, Gatun.....	\$2, 175, 195. 55			\$2, 416, 811. 64
4,500-kilowatt turbogenerators:				
Unit No. 5.....		\$69, 061. 93		
Unit No. 6.....		172, 554. 16		
Diesel electric plant, Miraflores.....	1, 969, 232. 85			1, 969, 232. 85
Substations.....	1, 598, 843. 33			1, 598, 843. 33
Transmission lines.....	1, 560, 695. 81			1, 560, 695. 81
Distribution system.....	2, 144, 014. 12			2, 226, 777. 72
Ancon.....		21, 671. 99		
Balboa.....		1, 913. 64		
Diablo.....		36, 859. 07		
La Boca.....		801. 89		
Miraflores.....		1, 000. 55		
Gatun.....		1, 096. 02		
Margarita.....		4, 608. 50		
Cristobal.....		1, 984. 91		
Silver City.....		9, 192. 58		
Camp Colner.....		4, 244. 65		
Colon.....		276. 57	\$886. 77	
Madden Dam system.....	1, 728, 152. 54			1, 728, 152. 54
Total, electric power system.....	11, 176, 134. 20	325, 266. 46	886. 77	11, 500, 513. 89
Electrical Work, Cristobal.....	381, 272. 02			380, 933. 20
Reroof building No. 7051.....		5, 661. 18		
Zone water system.....	1, 743, 996. 63			1, 799, 984. 55
Mains: Balboa to Fort Amador.....		41, 108. 74		
Distribution lines:				
Ancon.....		1, 195. 75		
Balboa.....		2, 251. 02		
La Boca.....		1, 548. 76		
Miraflores.....		177. 60		
Gatun.....		122. 19		
Margarita.....		3, 754. 66		
Camp Colner.....		6, 403. 56		
Silver City.....			257. 46	
Colon.....			316. 90	
Zone-Panama Water System.....	3, 907, 049. 39			3, 927, 817. 44
Mains:				
Balboa to Gorgas Hospital.....		20, 499. 49		
Gamboa to Miraflores.....		268. 56		
Zone-Colon Water System.....	1, 520, 061. 54			1, 520, 061. 54
Total, water system.....	7, 171, 107. 56	77, 330. 33	574. 36	7, 247, 863. 53
Municipal engineering work.....	143, 018. 12			143, 018. 12
Balboa shops.....	2, 488, 454. 94	174, 342. 91		2, 662, 797. 85
Cristobal shops.....	604, 005. 88			604, 005. 88
Total, mechanical shops.....	3, 092, 460. 82	174, 342. 91		3, 266, 803. 73
Balboa oil-handling plant.....	935, 328. 92			969, 828. 59
Purchase and installation of 400-horse- power boiler.....		34, 499. 67		
Cristobal oil-handling plant.....	1, 255, 299. 47			1, 291, 576. 98
Purchase and installation of 400-horse- power boiler.....		36, 277. 51		
Total, oil-handling plants.....	2, 190, 628. 39	70, 777. 18		2, 261, 405. 57
General storehouses.....	1, 687, 550. 10			1, 518, 429. 98
Balboa: Building 3 to mechanical divi- sion.....			165, 844. 94	
Cristobal: Boat landing (demolished).....			3, 275. 48	
Total, general storehouses.....	1, 687, 550. 40		169, 120. 42	1, 518, 429. 98
Motor transportation division.....	402, 802. 93			407, 384. 21
Repair shops: Construct sand blast shed.....		4, 581. 28		
Building division.....	83, 018. 21			92, 895. 53
Construct paint shop building, Balboa.....		9, 877. 32		

TABLE NO. 4.—*Business fixed property, fiscal year 1947*—Continued

	Balance, June 30, 1947	Additions and transfers	Retire- ments and transfers	Balance, July 1, 1946
Gold quarters.....	\$15,254,415.15			\$15,927,657.25
New quarters:				
Ancon-Balboa.....		\$250,253.51		
Margarita.....		414,075.39		
Alterations and improvements.....		53,217.00		
Preliminary plans and studies.....		18,799.33		
Quarters buildings sold:				
Ancon No. 44.....			\$1,300.00	
Ancon No. 451.....			1,000.00	
Balboa No. 830.....			5,000.00	
Balboa No. 840.....			5,000.00	
Gatun No. 189.....			2,400.00	
Frijoles No. 227.....			933.30	
Cristobal No. 1724.....			2,400.00	
Gatun garage No. 29 (sold).....			2,364.57	
Ancon building No. 220 (partial fire loss).....			9,423.05	
Gatun building No. 75 (fire loss).....			32,382.21	
Total, gold quarters.....	15,254,415.15	736,345.23	63,103.13	15,927,657.25
Silver quarters.....	2,040,185.93			2,234,900.99
New quarters: Camp Colner.....		153,087.46		
Alterations and improvements:				
La Boca.....		20,470.98		
Paraiso.....		323.96		
Convert Navy buildings to silver quar- ters: Camp Blerd.....		19,359.87		
Mindl building 2 (to Canal general property).....			3,560.73	
Gatun building 1903 (sold).....			1,401.39	
Monte Lirio building 132 (sold).....			4,000.00	
Plans and preparation of sites.....		10,434.91		
Total, silver quarters.....	2,040,185.93	203,677.18	8,962.12	2,234,900.99
Gasoline service stations.....	48,480.69			48,480.69
Clubhouse business structures.....	743,901.11			743,901.11
Total, business fixed property.....	44,414,975.53	1,607,859.07	242,646.80	45,780,187.80

TABLE NO. 5.—*Business equipment, fiscal year 1947*

	Balance, July 1, 1946	Additions and transfers	Retire- ments and transfers	Balance, June 30, 1947
Electric power system.....	\$328,278.09			\$328,278.09
Electrical work.....	6,931.55			6,931.55
Municipal work.....	292,573.01	\$2,235.69	\$63,410.64	231,398.06
Sosa Hill plant.....		60,187.14		60,187.14
Mechanical shops.....	2,608,350.99	246,043.58	98,312.40	2,756,082.17
General storehouses.....	168,241.55	1,654.08		169,895.63
Motor transportation.....	1,232,494.07	137,582.38	23,280.37	1,346,796.08
Building division.....	185,773.82	6,840.69	4,724.13	187,890.38
Panama Canal press.....	138,576.63			138,576.63
Total, business equipment.....	4,961,219.71	454,543.56	189,727.54	5,226,035.73

TABLE NO. 6.—*Capital assets, depreciable and nondepreciable, fiscal year 1947*

	Depreciable	Nondepreciable ¹	Balance June 30, 1947
Canal general property:			
Channels, harbors, and basins.....		\$150,606,066.14	\$150,606,066.14
Breakwaters.....		9,599,430.77	9,599,430.77
Locks.....	\$66,283,548.37	15,276,232.29	81,559,780.66
Dams:			
Madden.....	5,508,509.79	4,264,494.19	9,773,003.98
Other.....		12,310,781.73	12,310,781.73
Spillways.....	3,791,569.33	1,930,653.63	5,722,222.96
Aids to navigation.....	1,030,979.43		1,030,979.43
Wharves and piers.....	8,832,085.59		8,832,085.59
Drydocks.....	3,341,613.50	978,421.54	4,320,035.04
Coaling plants.....	5,294,623.64		5,294,623.64
Dredging division plant.....	984,705.16		984,705.16
Ferry plants.....	1,168,601.38		1,168,601.38
Titles and treaty rights.....		59,466,310.78	59,466,310.78
Office buildings.....	2,139,263.89		2,139,263.89
Other general buildings and structures.....	486,998.71		486,998.71
Gorgas Hospital.....	2,231,620.71		2,231,620.71
Colon Hospital.....	760,601.12		760,601.12
Margarita Hospital.....	401,196.46		401,196.46
Corozal Hospital.....	760,065.83		760,065.83
Palo Seco Leprosarium.....	190,551.16		190,551.16
Dispensaries.....	387,799.13		387,799.13
Quarantine stations.....	65,839.97		65,839.97
Other health department buildings.....	118,690.93		118,690.93
Schoolhouses.....	3,374,636.86		3,374,636.86
Recreational structures.....	472,002.23		472,002.23
Police stations.....	289,007.98		289,007.98
Prisons.....	79,899.37		79,899.37
Fire stations.....	121,749.77		121,749.77
Courthouses.....	187,732.73		187,732.73
Post offices.....	238,468.34		238,468.34
Other civic buildings and structures.....	35,839.12		35,839.12
Permanent town sites.....		2,512,023.39	2,512,023.39
Roads, streets, and sidewalks.....		6,404,541.80	6,404,541.80
Sewer system.....		1,003,147.59	1,003,147.59
Street lighting system.....		267,003.74	267,003.74
Interest during construction period.....		128,991,063.00	128,991,063.00
Total Canal general property (table No. 2).....	108,578,200.50	393,610,170.59	502,188,371.09
Floating plant (table No. 3).....	9,865,620.80		9,865,620.80
Canal defense property (incomplete).....		69,827,854.68	69,827,854.68
Construction, additional facilities (incomplete).....		78,798,039.02	78,798,039.02
Business fixed property (table No. 4).....	45,780,187.80		45,780,187.80
Business equipment (table No. 5).....	5,226,035.73		5,226,035.73
Total, capital assets.....	169,450,044.83	542,236,064.29	711,686,109.12

¹ Channels, harbors, basins, breakwaters, and municipal assets are maintained at original values from current operating expenses. Other nondepreciable property includes excavation and earth fills at locks, dams, and drydocks, and earth saddles at Madden Dam; also certain projects which were incomplete at the close of the fiscal year.

TABLE NO. 7.—*Public works in cities of Panama and Colon, fiscal year 1947*

Until December 31, 1945, The Panama Canal supplied water to the cities of Panama and Colon from the Canal Zone water system, and maintained the water-distribution system, the sewerage system and the streets in the two cities under contracts entered into between The Panama Canal and the Republic of Panama in 1907 and 1910. The Panama Canal collected the water rentals from the residents of these two cities and used the funds to cover the cost of water and maintenance of the water and sewerage systems and the streets, interest on the unamortized investment at 2 percent per annum and amortization based on 50 years from 1907.

Effective January 1, 1946, the old contracts were superseded by the instrument of transfer dated December 28, 1945, in conformity with Executive Order No. 9551 of May 16, 1945, and pursuant to the provisions of Public Law No. 48, approved May 3, 1943, under which the water and sewerage systems were transferred to the Republic of Panama, and under which provision was made for The Panama Canal to supply water to the cities of Panama and Colon at the cost to the United States at the boundary.

As a result of the transfer of these properties to the Republic of Panama the unamortized value of \$669,226.38, consisting of \$364,400.-91 for the city of Panama and \$304,825.47 for the city of Colon, as of December 31, 1945, was written out of The Panama Canal books.

Since the management, operation, and maintenance of the water and sewerage systems is no longer a Panama Canal operation, although still performed by that organization but for the account of the Republic of Panama, this table will not appear in the published annual report hereafter.

REPORT OF GOVERNOR OF THE PANAMA CANAL

113

	Disbursing clerk, Washington, D. C.	Paymaster, Canal Zone	Collector, Canal Zone	Total	U. S. Treasury	Total
ACCOUNTABLE BALANCE JULY 1, 1946, BY APPROPRIATIONS AND FUNDS						
Maintenance and operation, Panama Canal	\$1,084,470.36	\$3,502,893.57	\$178,382.47	\$4,765,746.40	\$7,434,521.03	\$12,200,267.43
Sanitation, Canal Zone, Panama Canal	3,197.01	319,974.91	11,804.46	334,976.38	36,139.36	371,115.74
Civil government, Panama Canal and Canal Zone	1,554.68	122,429.98	3,089.09	127,073.75	70,941.68	198,015.43
Postal funds, Canal Zone (special fund)	2,627.49	53,471.18	146,734.05	202,832.72	236,042.30	438,875.02
Repatriation of unemployed aliens, Panama Canal		10,883.78		10,883.78	45,000.00	55,883.78
Memorial to Maj. Gen. George W. Goethals	31,190.24	588,350.61	1,728.43	621,269.28	156,508.58	777,777.86
Construction, additional facilities, Panama Canal		60,690.00		60,690.00	4,233,222.61	4,854,491.89
Working fund, Panama Canal: Hospitalization of military personnel						60,690.00
Total	1,123,039.78	4,658,694.03	341,738.50	6,123,472.31	12,212,375.56	18,335,847.87
APPROPRIATIONS, FISCAL YEAR 1947						
Maintenance and operation, Panama Canal					12,749,000.00	12,749,000.00
Sanitation, Canal Zone, Panama Canal					2,800,000.00	2,800,000.00
Civil government, Panama Canal and Canal Zone					2,763,000.00	2,763,000.00
Total					18,312,000.00	18,312,000.00
TRANSFERS BETWEEN FISCAL OFFICERS						
Maintenance and operation, Panama Canal	8,700,000.00	26,619,315.37		35,319,315.37	1,131,922.42	36,451,237.79
Sanitation, Canal Zone, Panama Canal	345,000.00	4,454,414.06		4,799,414.06	75,867.50	4,875,281.56
Civil government, Panama Canal and Canal Zone	100,000.00	2,974,884.72		3,074,884.72	19,803.60	3,094,688.32
Postal funds, Canal Zone (special fund)	25,000.00	590,000.00		615,000.00	787,416.94	1,402,416.94
Repatriation of unemployed aliens, Panama Canal		34.70		34.70		34.70
Construction, additional facilities, Panama Canal	375,000.00	2,308,599.11		2,683,599.11	60,323.37	2,743,922.48
Working fund, Panama Canal: Hospitalization of military personnel	34,689.00	136,500.00		171,189.00	171,189.00	342,378.00
Total	9,579,689.00	37,083,747.96		46,663,436.96	2,246,322.83	48,909,759.79
COLLECTIONS PAYABLE TO APPROPRIATIONS						
Maintenance and operation, Panama Canal	521,854.14	1,776,936.60	21,120,885.13	23,419,675.87	299,897.22	23,719,573.09
Sanitation, Canal Zone, Panama Canal	59,909.73	33,686.25	1,838,902.68	1,932,498.66	1,384.14	1,933,882.80
Civil government, Panama Canal and Canal Zone	399.92	24,896.27	226,188.68	251,484.87		251,484.87
Postal funds, Canal Zone (special fund)	9,900.00		729,087.39	738,987.39		738,987.39
Repatriation of unemployed aliens, Panama Canal		85.73	34.70	120.43		120.43
Construction, additional facilities, Panama Canal	15,398.43		109,265.14	124,663.57		124,663.57
Working fund, Panama Canal: Hospitalization of military personnel	136,500.00			136,500.00		136,500.00
Total	743,962.22	1,835,604.85	24,024,363.72	26,603,930.79	301,281.36	26,905,212.15
Total to be accounted for	11,446,691.00	43,578,046.84	24,366,102.22	79,390,840.06	33,132,179.75	112,523,019.81

¹ Includes \$850,000 by supplemental appropriations approved May 1, 1947; \$400,000, and May 26, 1947; \$450,000.

² Includes \$357,000 by supplemental appropriation approved May 26, 1947.

TABLE No. 8.—Appropriated funds, receipts, and disbursements, fiscal year ended June 30, 1947—Continued

COVERED INTO THE U. S. TREASURY					
Disbursing clerk, Washington, D. C.	Paymaster, Canal Zone	Collector, Canal Zone	Total	U. S. Treasury	Total
Business net revenues, fiscal year 1946: Maintenance and operation, Panama Canal.....	856,152.11		856,152.11		856,152.11
TRANSFERS BETWEEN FISCAL OFFICERS					
Maintenance and operation, Panama Canal.....		21,169,315.37	22,301,237.79	14,150,000.00	36,451,237.79
Sanitation, Canal Zone, Panama Canal.....		1,829,414.06	1,905,281.56	2,970,000.00	4,875,281.56
Civil government, Panama Canal and Canal Zone.....		224,884.72	244,688.32	2,850,000.00	3,094,688.32
Postal funds, Canal Zone (special fund).....		775,523.52	787,416.94	615,000.00	1,402,416.94
Reparation of unemployed aliens, Panama Canal.....		34.70	34.70		34.70
Construction, additional facilities, Panama Canal.....		108,599.11	108,922.48	2,575,000.00	2,743,922.48
Working fund, Panama Canal: Hospitalization of military personnel.....	34,689.00		171,189.00	171,189.00	342,378.00
Total.....	34,689.00	24,107,771.48	25,578,770.79	23,331,189.00	48,909,959.79
DISBURSEMENTS					
Maintenance and operation, Panama Canal.....	27,340,636.02		35,841,728.71	11,629.63	35,853,358.34
Sanitation, Canal Zone, Panama Canal.....	4,434,692.06		4,758,800.07	14.00	4,758,820.07
Civil government, Panama Canal and Canal Zone.....	2,914,454.94		2,984,885.93		2,984,885.93
Postal funds, Canal Zone (special fund).....	597,326.31		614,558.00	240,182.09	854,740.09
Reparation of unemployed aliens, Panama Canal.....	3,976.35		3,976.35		3,976.35
Construction, additional facilities, Panama Canal.....	2,430,453.36		2,730,103.14	2,730,103.14	2,730,103.14
Working fund, Panama Canal: Hospitalization of military personnel.....	123,478.25		158,167.25		158,167.25
Total.....	37,845,018.19		47,092,225.45	251,825.72	47,344,051.17
ACCOUNTABLE BALANCE, JUNE 30, 1947					
Maintenance and operation, Panama Canal.....	3,702,357.41	129,952.23	4,505,619.03	7,453,711.04	11,959,330.07
Sanitation, Canal Zone, Panama Canal.....	373,382.26	21,293.08	402,801.47	3,377.00	4,06,178.47
Civil government, Panama Canal and Canal Zone.....	207,756.03	4,393.05	223,869.09	3,745.98	227,614.37
Postal funds, Canal Zone (special fund).....	46,144.87	100,297.92	151,845.17	168,277.15	323,122.32
Reparation of unemployed aliens, Panama Canal.....	7,027.86		7,027.86	145,000.00	152,027.86
Memorial to Maj. Gen. George W. Goethals.....				156,508.58	156,508.58
Construction, additional facilities, Panama Canal.....	466,496.36	2,394.46	530,506.34	1,718,545.98	2,249,052.32
Working fund, Panama Canal: Hospitalization of military personnel.....	39,022.75		39,022.75		39,022.75
Total.....	4,842,187.54	258,330.74	5,863,691.71	9,549,165.03	15,412,856.74
Total accounted for.....	43,578,046.84	24,366,102.22	79,390,840.06	33,132,179.75	112,523,019.81

TABLE No. 9.—*Custodial funds, receipts and disbursements, fiscal year ended June 30, 1947*

	Disbursing clerk, Washington, D. C.	Paymaster, Canal Zone	Collector, Canal Zone	Total	U. S. Treasury	Total
ACCOUNTABLE BALANCE JULY 1, 1946						
Revenue due U. S. Treasury						
Security deposits	\$7.48			\$167,116.71		\$167,116.71
Clubhouse funds	309,288.97	\$182,029.80	2,448,898.92	2,940,137.69		2,940,137.69
Money-order funds			42,280.64	42,280.64	\$1,638,382.59	1,680,663.23
Total	309,286.45	182,029.80	68,893.81	10,913,582.30	10,844,638.49	15,701,449.93
RECEIPTS						
Revenue due U. S. Treasury						
Security deposits	711.52	38.97	17,851,672.02	17,852,422.51		17,852,422.51
Clubhouse funds	202,282.36	11,566,539.70	29,717,772.80	41,486,594.86		41,486,594.86
Money-order funds			4,750,594.50	4,750,594.50		4,750,594.50
Total	202,993.88	11,566,578.67	9,816,180.37	73,905,792.24		73,905,792.24
Total	512,280.33	11,748,608.47	62,136,219.69	77,124,221.09	12,483,021.08	89,607,242.17
Transfer to U. S. Treasury:						
Clubhouse funds			(4,761,672.96)	(4,761,672.96)	4,761,672.96	
Money-order funds			(8,972,562.95)	(8,972,562.95)	8,972,562.95	
Total to be accounted for	512,280.33	11,748,608.47	51,129,116.38	63,389,985.18	26,217,256.99	89,607,242.17
COVERED INTO U. S. TREASURY						
Revenue due U. S. Treasury	719.00	38.97	17,743,754.08	17,744,512.05		17,744,512.05
Security deposits	467,277.09	11,730,975.18	29,927,030.50	42,125,282.77		42,125,282.77
Clubhouse funds						
Money-order funds			889,040.00	889,040.00	4,550,372.72	4,550,372.72
Total	467,996.09	11,731,014.15	48,559,824.58	60,758,834.82	9,015,111.98	9,904,151.98
ACCOUNTABLE BALANCE JUNE 30, 1947						
Revenue due U. S. Treasury						
Security deposits	44,264.24	17,594.32	275,027.17	275,027.17		275,027.17
Clubhouse funds			2,239,591.22	2,301,449.78		2,301,449.78
Money-order funds			31,202.18	31,202.18	1,849,682.83	1,880,885.01
Total	44,264.24	17,594.32	23,471.23	23,471.23	10,802,089.46	10,825,560.69
Total accounted for	512,280.33	11,748,608.47	2,569,291.80	2,631,150.36	12,651,772.29	15,282,922.65
Total			51,129,116.38	63,389,985.18	26,217,256.99	89,607,242.17

¹ Includes \$5,950,000 invested in U. S. Treasury bonds; \$3,500,000 in U. S. Treasury notes; and \$400,000 in United States Saving bonds, a total of \$9,850,000.

² Total per balance sheet, table No. 1, \$15,299,147.05; includes \$16,224.40 of bills in process of collection.

NOTE.—Parentheses denote deduction.

Custodial funds cover cash transactions which are controlled by separate fiscal regulations from those which govern the expenditure of appropriations made by Congress for maintenance and operation of The Panama Canal.

Revenue due United States Treasury covers collections for deposit as miscellaneous receipts of the United States Government which form no part of the working cash of The Panama Canal, as those funds must by law immediately be covered into the United States Treasury and relinquished from control of The Panama Canal. These collections consist mainly of tolls, licenses, and court fees and fines.

Security deposits cover cash received by Canal fiscal officers from banks, individuals, and companies to guarantee payment of bills rendered by The Panama Canal and the Panama Railroad Co., and to guarantee fulfillment of contracts. Disbursements of these funds represent transfers to revenue due United States Treasury on this table, collections repayable to appropriations on the preceding table, and the return of unexpended balances to depositors.

Special deposit funds cover certain activities conducted by the Canal Zone Government separately from appropriations, principally postal-money order funds, and transactions of Panama Canal club-houses maintained exclusively for employees.

TABLE NO. 10.—*Accounts receivable*

REGISTERED DURING THE YEAR

	Fiscal year 1947	Fiscal year 1946
Repaid to appropriations:		
Panama Railroad Co.....	\$3,953,979.15	\$3,568,914.50
Other departments of the U. S. Government.....	302,462.39	9,299,430.80
Individuals and companies.....	14,605,701.04	9,702,695.18
Total.....	18,862,142.58	22,571,040.48
Miscellaneous receipts:		
Tolls.....	17,666,455.24	14,810,523.72
Public works, Republic of Panama.....		49,463.85
Other miscellaneous receipts.....		49.98
Total.....	17,666,455.24	14,860,037.55
Total accounts receivable registered.....	36,528,597.82	37,431,078.03
Number of bills registered.....	53,122	70,759

ACCOUNTS RECEIVABLE END OF FISCAL YEAR

Audited bills.....	\$1,919,456.67	\$2,539,189.06
Hospital certificates.....	57,042.53	47,798.49
Injury compensation.....		11,053.60
Unredeemed commissary coupons.....		54.00
Drums, carboys, reels, and cylinders returned for credit.....	4,131.56	3,088.21
Total.....	2,010,630.76	2,601,183.36

The balance at the end of the fiscal year includes all amounts due The Panama Canal except items of utility service, principally from employees, which are not credited to earnings until collected, usually by pay-roll deductions.

TABLE NO. 11.—*Materials and supplies*

	Fiscal year 1947	Fiscal year 1946
Stock on hand, first of year:		
Balboa store.....	\$5,258,851.56	\$5,510,070.65
Medical store.....	287,637.75	283,705.60
Administration building store.....	57,555.53	63,389.92
Gamboa store.....	1,674,267.03	1,686,208.55
Cristobal store.....	1,246,449.87	1,196,661.66
Locks store.....	652,960.44	702,576.29
Oil-handling plants.....	357,133.49	252,410.54
Panama Canal press.....	277,348.03	261,020.08
Sand and gravel pile.....	52,572.87	91,710.36
Division stores.....	845,918.76	635,783.24
Total stock value.....	10,710,695.33	10,683,536.89
Reserve for inventory adjustments.....	1,187,219.06	1,723,356.52
Book value of stock on hand.....	9,523,446.27	8,960,180.37
Receipts of material:		
Purchases for stock.....	8,220,555.35	6,700,584.47
Purchases for divisions.....	2,955,371.52	3,137,626.65
Local production.....	483,126.00	578,246.50
Book value of receipts.....	11,659,052.87	10,416,457.62
Total charges to stock.....	21,182,499.14	19,376,637.99
Issues and sales of material:		
Issues to Canal divisions.....	2,972,032.38	2,899,520.68
Issues to business divisions.....	5,385,108.06	6,282,226.83
Less:		
Returns to stock.....	77,165.82	1,236,233.41
Returns for resale to outsiders.....	142,274.93	113,423.12
Net issues to divisions.....	8,137,699.69	7,832,090.98
Sales.....	2,205,691.00	2,173,801.21
Total issues and sales.....	10,343,390.69	10,005,892.19
Adjustment of stock mark-up.....		350,658.26
Price and inventory adjustments.....	(73,375.41)	242,884.25
Variation in division stores.....	(188,403.85)	(210,135.52)
Variation in reserve for inventory adjustments.....	(84,257.90)	(536,107.46)
Total credits to stock.....	9,997,353.53	9,853,191.72
Stock on hand, end of year:		
Balboa store.....	6,051,966.45	5,258,851.56
Medical store.....	320,504.38	287,637.75
Administration building store.....	60,776.65	57,555.53
Gamboa store.....	1,807,676.37	1,674,267.03
Cristobal store.....	1,451,136.36	1,246,449.87
Locks store.....	564,456.43	652,960.44
Oil-handling plants.....	656,158.97	357,133.49
Panama Canal press.....	307,591.68	277,348.03
Sand and gravel pile.....	33,516.87	52,572.87
Division stores.....	1,034,322.61	845,918.76
Total stock value.....	12,288,136.77	10,710,695.33
Reserve for inventory adjustments.....	1,102,991.16	1,187,219.06
Book value of stock on hand.....	11,185,145.61	9,523,446.27

NOTE.—Parentheses denote deductions.

In the foregoing table, the values of stock on hand at the beginning and end of year and receipts and issues of material are shown at invoiced cost plus an amount for procurement to cover United States inland freight, ocean freight, and purchase and inspection expense.

TABLE No. 12.—*Work in progress*

	Fiscal year 1947	Fiscal year 1946
Electrical division.....	\$2,374.00	\$471.59
Municipal division.....	65.82	164.33
Shops and drydocks.....	512,713.23	278,319.84
Motor transportation division.....	3,453.92	2,093.97
Building division.....	267.93	12,713.11
Panama Canal press.....	12,591.65	5,986.71
Total work in progress.....	531,466.55	299,749.55

This account covers the amounts expended on uncompleted jobs, and will ultimately be cleared to operating expenses of the division indicated, with corresponding credits to their revenues after application of authorized charges to cover division overhead expense.

TABLE No. 13.—*Deferred charges*

	Fiscal year 1947	Fiscal year 1946
Atlantic Locks.....		\$3,720.00
Port captain, Balboa.....	\$87,224.63	
Dredging division.....	727,718.24	603,620.44
Experimental gardens.....	1,860.56	2,956.37
Personnel administration.....		20,000.00
Transportation of employees on the Isthmus.....	(2,647.55)	
Offices in the United States.....	8,501.57	
General accounts, suspense.....	207,489.68	219,921.93
Schools.....	1,402.73	
Physical education and recreation.....		115.50
Panama Canal clubhouses.....	3.20	87.78
Electrical work.....	311.89	507.06
Water system.....	2,520.00	2,478.00
Municipal work.....	7.27	463.93
Mechanical division.....	35,964.25	75,249.53
Oil-handling plants.....	763.25	313.58
General storehouses, sundries suspense.....	(3,776.12)	2,121.50
Building division.....	41,209.07	34,251.24
Gold quarters.....		38,822.59
Gasoline service stations.....	5,187.20	4,809.82
Gamboa gravel plant.....	21.00	
Public works:		
Panama.....	161,377.67	606,672.59
Colon.....	737,888.71	824,316.78
Total.....	2,013,027.25	2,440,428.64

NOTE.—Parentheses denote credit balance.

This account covers expenses incurred for account of divisions indicated, but which are not chargeable to operating accounts of the current fiscal year. These amounts are charged as soon as values are consumed.

The credit balance shown for transportation of employees on the Isthmus is due to monthly lump-sum payment, for official travel, to the Panama Railroad Co. being less than the value of the transportation actually furnished to The Panama Canal. The monthly payment is periodically revised and normal balance should be reflected within a short time.

The credit balance shown for general storehouses, sundries suspense, is a composite balance consisting of debit items of \$12,160.73 and credit items of \$15,936.85 which were not cleared during the current fiscal year to the operating accounts to which they pertain. These items will be cleared in the normal course of business in the accounts for July 1947.

TABLE NO. 14.—*Capital investment*

Appropriations for canal construction to July 1, 1921 (detail in Annual Report for 1924, table No. 3)-----	\$386, 910, 301. 00
Deduct value of capital stock of the Panama Railroad Co.----	7, 000, 000. 00
Net construction appropriations-----	379, 910, 301. 00
Annual payments to the Republic of Panama, 1913 to 1920 (State Department)-----	2, 000, 000. 00
Additional construction funds, July 1, 1921 to July 1, 1947----	207, 795, 600. 12
Total cash investment-----	589, 705, 901. 12
Interest of construction funds (compounded annually), 1904 to 1920-----	128, 991, 063. 00
Total capital investment-----	718, 696, 964. 12

The capital investment account covers the following assets, showing the total as of July 1, 1946, the increase for the current fiscal year, and total as of June 30, 1947.

	July 1, 1946	Increase	June 30, 1947
Canal general property (table No. 2)-----	\$500, 986, 703. 81	\$1, 201, 667. 28	\$502, 188, 371. 09
Floating plant (table No. 3)-----	9, 876, 628. 20	(11, 007. 40)	9, 865, 620. 80
Canal defense property-----	68, 980, 089. 98	847, 764. 70	69, 827, 854. 68
Additional facilities-----	75, 989, 997. 14	2, 808, 041. 88	78, 798, 039. 02
Business fixed property (table No. 4)-----	44, 414, 975. 53	1, 365, 212. 27	45, 780, 187. 80
Business equipment (table No. 5)-----	4, 961, 219. 71	264, 816. 02	5, 226, 035. 73
Proportion of working capital (table No. 23)-----	7, 010, 855. 00	-----	7, 010, 855. 00
Total capital investment-----	712, 220, 469. 37	6, 476, 494. 75	718, 696, 964. 12
Less accrued depreciation (table No. 16)-----	51, 324, 670. 87	2, 414, 071. 32	53, 738, 742. 19
Net capital investment-----	660, 895, 798. 50	4, 062, 423. 43	664, 958, 221. 93

NOTE.—Parentheses denote decrease.

The total capital investment at the close of the fiscal year 1947 amounted to \$718,696,964.12. The increase of \$6,476,494.75 is due to the making of necessary additions to plant and equipment as shown on tables No. 2, 3, 4, and 5.

Interest on the net capital investment from 1921 to date is considered as a charge to operating expenses, and while this charge does not appear on the balance sheet, a statement of such interest compared with net revenues, by years, is shown on table No. 21. Interest for the current fiscal year is based upon a net capital investment of \$515,925,711.38 as of July 1, 1946, as follows, which does not include investment in Canal defense property or additional facilities, and amounts to \$15,477,771.34.

Canal general property.....	\$500, 986, 703. 81
Floating plant.....	9, 876, 628. 20
Business fixed property.....	44, 414, 975. 53
Business equipment.....	4, 961, 219. 71
Proportion of working capital.....	7, 010, 855. 00
Total.....	567, 250, 382. 25
Less accrued depreciation.....	51, 324, 670. 87
Net capital investment for interest.....	515, 925, 711. 38

TABLE No. 15.—*Accounts payable*

	Fiscal year 1947	Fiscal year 1946
United States invoices.....	\$153, 521. 19	(\$175, 260. 15)
Isthmus vouchers.....	270, 086. 51	203, 087. 56
Current pay rolls.....	2, 697, 191. 57	2, 778, 276. 71
Accrued salaries and wages.....	138, 921. 27	32, 461. 37
Unpaid salaries and wages.....	38, 514. 55	31, 402. 11
Tanker freight.....	18, 860. 35	8, 382. 16
Panama Railroad freight average.....	3, 317. 16	(3, 886. 65)
Total.....	3, 320, 412. 60	2, 874, 463. 11

NOTE.—Parentheses denote debit balance.

The above table covers all current obligations of The Panama Canal, except deposits to guarantee payment of bills, and special deposit funds, all of which are covered by table No. 9, custodial funds.

TABLE No. 16.—*Depreciation reserves, fiscal year 1947*

CANAL DEPRECIATION

	Balance, ¹ July 1, 1946	Accruals	Retirements and transfers	Balance, June 30, 1947
Locks	\$14,995,872.41	\$497,795.66	(\$14,193.24)	\$15,507,866.31
Madden Dam	604,995.02	55,085.09	-----	660,080.11
Spillways	660,936.12	21,320.52	-----	682,256.64
Aids to navigation	469,283.32	17,764.05	-----	487,047.37
Wharves and piers	3,296,354.78	171,393.73	-----	3,467,748.51
Dry docks	1,071,880.42	42,657.93	-----	1,114,538.35
Coaling plants	3,976,262.77	136,250.83	286,989.17	3,825,524.43
Dredging division plant	627,016.20	34,728.43	-----	661,744.63
Ferry plants	633,139.39	116,426.07	40,399.85	709,165.61
Office buildings	593,486.09	25,916.27	-----	619,402.36
Other general buildings and structures	267,798.96	10,495.47	21,430.44	256,863.99
Gorgas Hospital	509,299.41	25,361.18	-----	534,660.59
Colon Hospital	117,227.16	17,582.13	-----	134,809.29
Margarita Hospital	10,034.86	10,024.96	-----	20,059.82
Corozal Hospital	144,831.83	12,540.13	-----	157,371.96
Palo Seco Leprosarium	58,628.72	4,692.36	-----	63,321.08
Dispensaries	79,855.49	6,249.44	-----	86,104.93
Quarantine stations	65,392.70	-----	-----	65,392.70
Other health department structures	37,163.29	2,356.00	-----	39,519.29
Schoolhouses	392,867.34	33,639.06	-----	426,506.40
Recreational structures	107,671.18	6,924.55	-----	114,595.73
Police stations	57,111.36	6,262.05	-----	63,373.41
Prisons	13,999.95	2,020.23	-----	16,020.18
Fire stations	47,078.91	2,541.34	-----	49,620.25
Courthouses	111,190.55	3,754.65	-----	114,945.20
Post offices	20,893.08	2,967.31	-----	23,860.39
Other civic buildings and structures	29,534.86	1,519.88	8,601.69	22,503.05
Silver quarters	137,715.08	67,324.99	649.39	204,390.68
Contingent reserve	218,467.74	164,405.69	2 129,564.80	253,308.63
Total, Canal depreciation	29,356,038.99	1,500,000.00	473,437.10	30,382,601.89

NOTE.—Parentheses denote deductions.

¹ Due to reclassification of accounts, effective July 1, 1946, all Canal general property formerly listed as general buildings and structures is now classified under three groups, as follows:

- General buildings and structures.
- Health department buildings and structures.
- Civic buildings and structures.

Due to this regrouping, the sequence of certain items in the foregoing table does not coincide with that shown on similar table in report for fiscal year 1946. Total values, of course, have not been affected by the revised sequence.

² Residual values of following items:

Miraflores Ferry plant	\$25,842.30
Miraflores Locks building No. 3	1,669.09
Gatun Locks guards' quarters, building No. 26	14,690.36
Fire-truck house, Paraiso (alterations)	152.18
D. Q. M. office, Paraiso (alterations)	124.58
D. Q. M. paint shop, Paraiso (alterations)	102.18
Colon Hospital project (preliminary work)	41,230.98
Balboa coaling plant, 2 berm cranes	10,243.00
Cristobal coaling plant:	
Reloaders Nos. 3 and 4, unloader No. 4	15,177.18
North reclaiming bridge	20,332.95

Total

TABLE No. 16.—*Depreciation reserves, fiscal year 1947—Continued*

PLANT DEPRECIATION

	Balance, ¹ July 1, 1946	Accruals	Retirements and transfers	Balance, June 30, 1947
Floating plant:				
Tugs and crabsboats	\$1,336,534.44	\$60,860.00		\$1,427,394.44
Launches	434,932.79	77,192.71	\$15,289.64	496,835.86
Dredges	2,035,740.00	82,860.00	22,500.00	2,096,100.00
Pump scows	1,198,147.49	39,120.00		1,237,267.49
Machine barges	584,967.26	52,344.00		637,311.26
Lighters	220,659.24	14,592.00		235,251.24
Launch repair barges	4,872.00	1,392.00		6,264.00
Anchor barges	4,280.00	1,560.00		5,850.00
Total, floating plant	5,820,143.22	359,929.71	37,789.64	6,142,274.29
Business fixed property:				
Electric power system	3,159,832.91	187,453.32		3,347,286.23
Electrical work	80,107.32	9,729.36		89,836.68
Water system	1,673,224.67	166,612.00		1,839,836.67
Municipal work	32,683.43	3,282.00		35,965.43
Mechanical shops	1,224,115.28	64,468.73	(101,202.02)	1,389,786.03
Oil-handling plants	1,213,611.79	73,247.16		1,286,858.95
General storehouses	797,069.05	38,079.75	104,477.50	730,671.30
Motor transportation division	87,907.14	11,761.07		99,668.21
Building division	23,241.99	1,683.00		24,924.99
Gold quarters	3,704,921.07	391,196.47	63,103.13	4,033,014.71
Silver quarters	498,917.57		4,752.00	494,165.57
Clubhouse business structures	310,717.85	14,157.12		324,874.98
Gasoline service stations	24,275.70	1,641.49		25,917.19
Total, business fixed property	12,830,625.78	963,341.77	71,130.61	13,722,836.94
Business equipment:				
Electric power system	182,278.46	16,416.00		198,694.46
Electrical work	5,411.57	264.00		5,675.57
Municipal work	251,370.74	12,460.72	63,410.64	200,420.82
Sosa Hill plant			(60,187.14)	60,187.14
Mechanical shops	1,671,769.88	112,299.39	98,342.40	1,685,726.87
General storehouses	116,630.50	7,373.65	(419.03)	124,423.18
Motor transportation division	888,521.24	136,446.33	23,280.37	1,001,687.20
Building division	117,920.87	10,167.25	4,724.13	123,363.99
Panama Canal press	83,959.62	6,860.22		90,819.84
Total, business equipment	3,317,862.88	302,287.56	129,121.37	3,491,029.07
Total, business fixed property and equipment	16,148,488.66	1,265,629.33	200,251.98	17,213,866.01
Total, plant depreciation	21,968,631.88	1,625,550.04	238,041.62	23,356,140.30
SUMMARY				
Canal depreciation	\$29,356,038.99	\$1,500,000.00	\$473,437.10	\$30,382,601.89
Plant depreciation	21,968,631.88	1,625,550.04	238,041.62	23,356,140.30
Total depreciation	51,324,670.87	3,125,550.04	711,478.72	53,738,742.19

The accrued balance as of June 30, 1947, of \$53,738,742.19 applies to depreciable capital assets shown on tables Nos. 3, 4, 5, and 6, amounting to \$169,450,044.83.

TABLE No. 17.—*Reserve for repairs*

	Balance, July 1, 1946	Accruals	Charges	Balance, June 30, 1947
Tugs and crane boats.....	\$6,299.01	140,400.00	\$34,918.67	\$111,780.34
Dredges.....	183,686.42	204,581.00	95,231.16	293,036.26
Dump scows.....	(2,661.58)	119,440.00	3,785.44	112,992.98
Machine barges.....	21,248.80	26,700.00		47,948.80
Total, floating plant.....	208,572.65	491,121.00	133,935.27	565,758.38
Electrical work, equipment.....	36,755.25	63,353.58	100,867.22	(758.39)
Total, business equipment.....	36,755.25	63,353.58	100,867.22	(758.39)
Total reserve for repairs.....	245,327.90	554,474.58	234,802.49	564,999.99

NOTE.—Parentheses denote debit balance.

TABLE No. 18.—*Reserve for leave*

	Balance, July 1, 1946	Accruals	Charges	Balance, June 30, 1947
Electrical division.....	\$295,749.14	\$169,263.89	\$169,972.09	\$295,040.94
Municipal division.....	178,382.78	174,420.34	200,671.17	152,131.95
Shops and drydocks.....	545,193.23	511,662.67	865,161.95	191,693.95
Motor transportation division.....	215,614.41	137,169.88	152,864.42	199,919.87
Building division.....	178,532.46	165,643.32	198,726.79	145,448.99
Total reserve for leave.....	1,413,472.02	1,158,160.10	1,587,396.42	984,235.70

The foregoing table represents the reserve for vacation pay due employees of the principal business divisions. The reserve is credited by adding a percentage to direct labor charges for work performed by the divisions listed above to the credit of this account. The account is debited with the amount paid to employees when leave is actually taken.

TABLE NO. 19.—*Deferred credits*

	Fiscal year 1947	Fiscal year 1946
Pacific Locks	\$54,558.94	\$27,121.72
Atlantic Locks	49,831.50	
Office engineering division	2,017.65	3,836.65
Meteorology and hydrography	420.49	
Marine superintendent	16,500.00	
Port captain:		
Balboa	31,313.35	31,333.96
Cristobal	555.00	1,115.96
Aids to navigation subdivision	16,930.53	20,571.78
Nautical books and charts	3,478.14	1,221.98
Dredging division	68,119.39	23,611.85
Public buildings and grounds	19,927.03	7,676.93
Air terminal	2,745.80	10,581.17
Personnel administration	35.00	
Pay-roll bureau	1,000.00	
Paymaster's office	6,630.00	
Accounting department	12,687.40	4,041.81
Offices in the United States	1,240.00	2,800.00
General accounts, suspense	520,791.09	272,491.11
Ex-employees' transportation differential	18.00	18.00
Recruiting, general: Maintenance and operation	36,382.77	
Repatriation, general: Maintenance and operation	248,532.75	
Recruiting, general: Sanitation	15,957.89	
Repatriation, general: Sanitation	20,246.44	
Recruiting, general: Civil government	13,166.22	
Repatriation, general: Civil government	14,242.86	
Recruiting, general: Postal service	7,717.56	
Repatriation, general: Postal service	5,341.07	
Health department	79,815.02	78,071.08
Schools	848.70	14,001.98
Library	546.00	2,236.87
Police and prisons	1,951.09	5,786.43
Fire section	2,467.00	1,300.00
Magistrates' courts	74.62	
District court		195.16
Special engineering division	444,774.61	140,736.34
Postal service	157,715.27	188,871.22
Panama Canal clubhouses	10.50	
Electric power system	26,463.90	34,883.25
Electrical work	64,454.56	79,724.07
Water system	22,393.99	40,676.43
Municipal work	975,271.77	1,587,540.45
Mechanical division	250,895.33	443,096.77
Oil-handling plants	52,933.29	113,776.30
General storehouses	744,366.89	536,316.05
Motor transportation division		45,048.50
Building division	4,044.75	48,508.06
Panama Canal press	19,087.16	9,808.21
Silver quarters		43,448.12
Subsistence section	6,391.62	17,072.45
Gasoline service stations		6,405.98
Contingencies:		
Maintenance and operation	54,226.94	53,973.61
Sanitation	33.13	
Civil government	260.27	260.27
Total	4,078,916.28	3,898,160.52

This account covers expenses accrued or estimated which have been charged to operating accounts, but for which it was impracticable to institute corresponding payments at the close of the accounting period. These amounts are cleared as soon as corresponding charges are passed or payment or contingent expenses arise.

TABLE NO. 20.—Consolidated statement of income, expenses, and net revenues

	Fiscal year 1947	Fiscal year 1946
Canal operations:		
Canal revenues:		
Tolls.....	\$17,642,146.24	\$14,791,807.14
Postal surplus.....	(100,464.44)	82,254.16
Other miscellaneous receipts.....	210,276.27	185,430.44
Total Canal revenues (table No. 24).....	17,751,958.07	15,059,491.74
Canal earnings (table No. 25).....	10,470,933.19	10,693,502.16
Total revenues.....	28,222,891.26	25,752,993.90
Canal expenses:		
Management.....	155,572.85	120,358.51
Operation and maintenance.....	14,396,029.26	13,492,773.96
Utilities and services.....	4,663,046.08	4,380,650.23
Sanitation.....	5,237,870.11	4,692,832.62
Civil government.....	3,251,963.94	2,657,291.00
Postal service.....	840,360.21	563,726.00
Total expenses.....	28,544,842.45	25,907,632.32
Net canal deficit (table No. 25).....	(321,951.19)	(154,638.42)
Fixed capital charge.....	14,401,797.10	14,395,786.70
Surplus or (deficit).....	(14,723,748.29)	(14,550,425.12)
Business operations:		
Business revenues.....	35,623,168.93	40,783,231.51
Business expenses.....	34,480,827.91	39,906,396.22
Net business revenues.....	1,142,341.02	876,835.29
Fixed capital charge.....	1,075,974.24	1,031,554.16
Surplus or (deficit).....	66,366.78	(154,718.87)
Combined operations:		
Revenues.....	63,846,060.19	66,536,225.41
Expenses.....	63,025,670.36	65,814,028.54
Net revenues.....	820,389.83	722,196.87
Fixed capital charge at 3 percent.....	15,477,771.34	15,427,340.86
Surplus or (deficit).....	(14,657,381.51)	(14,705,143.99)
Net capital investment (table No. 14).....	515,925,711.38	514,244,695.58
Combined net revenues.....	820,389.83	722,196.87
Percent of capital return.....	0.16	0.14

NOTE.—Parentheses denote deficit.

A summary comparison of net revenues and capital interest, by years, from 1921 to date, is shown on table No. 21, following, together with a brief description of accounting policy governing charges to operating expenses.

Table No. 25, Canal earnings and expenses, details by function earnings and expenses for the fiscal year 1947.

In addition to net profits of \$1,142,341.02 for the fiscal year 1947, see additional amount to be returned to the Treasury for prior fiscal years as detailed in table No. 26.

TABLE NO. 21.—*Revenues, expenses, and computed surplus*

Fiscal year	Tolls	Civil revenues	Business profits	Total revenues	Net appropriation expenses ¹	Net revenues	Capital interest 3 percent ²	Computed surplus ³
1914-20	\$83,303,581.67	\$1,206,579.86	\$536,098.34	\$5,016,259.87	\$36,657,766.89	(\$1,611,507.02)		(\$1,611,507.02)
1921	11,291,910.31	192,986.19	594,211.20	12,010,116.70	9,578,300.14	2,461,816.56	\$14,674,964.74	(12,213,148.18)
1922	11,193,381.47	192,288.85	323,259.16	11,708,851.48	8,469,017.63	3,239,833.85	15,253,780.02	(12,013,946.17)
1923	17,507,630.52	354,213.51	1,140,642.50	18,832,486.56	8,240,777.56	10,591,709.00	15,292,430.18	(4,610,721.18)
1924	21,289,603.16	392,250.73	1,901,624.12	25,583,478.01	8,923,905.39	16,659,572.62	15,150,880.31	1,908,692.29
1925	21,374,664.12	297,954.01	795,916.85	22,348,535.01	8,693,683.41	13,654,851.57	15,000,730.49	(1,417,888.92)
1926	22,927,456.03	217,680.50	841,310.29	23,986,446.82	8,543,468.47	15,442,978.35	15,085,580.61	357,397.71
1927	24,217,185.32	301,623.50	876,536.80	25,487,345.62	9,547,715.02	15,939,630.60	15,068,580.79	869,049.81
1928	26,943,513.11	232,532.57	736,719.43	27,912,765.11	9,501,200.82	18,411,564.29	15,035,029.20	3,376,535.00
1929	26,943,513.11	232,532.57	736,719.43	27,912,765.11	10,187,150.71	17,725,614.40	15,013,374.55	2,702,239.85
1930	27,077,117.36	349,255.35	592,761.17	28,019,133.68	9,893,920.93	18,125,212.75	14,987,927.80	3,137,204.85
1931	27,121,334.33	346,030.35	592,761.17	28,059,125.85	10,631,353.53	17,427,772.32	14,986,378.04	(3,172,586.60)
1932	20,766,598.49	327,444.23	557,095.44	21,591,138.16	10,239,211.84	11,351,926.32	14,911,807.66	(3,561,911.34)
1933	19,621,158.61	310,014.16	1,135,708.62	21,066,881.39	9,555,622.02	11,511,259.37	14,907,732.16	(3,396,522.79)
1934	24,085,065.16	96,693.67	1,365,755.12	25,547,513.95	7,941,383.77	17,606,130.18	15,039,203.81	2,567,926.37
1935	23,338,977.90	81,957.68	1,021,216.61	24,442,152.19	9,481,429.57	14,960,722.62	15,124,193.39	(163,470.77)
1936	23,506,806.46	119,915.21	920,185.23	24,546,906.90	9,675,067.13	14,871,839.77	15,159,597.04	(287,757.27)
1937	23,147,433.54	98,775.74	917,360.14	24,163,569.42	10,289,024.05	13,874,545.37	15,205,397.30	(1,331,451.93)
1938	23,215,192.39	90,335.19	824,612.60	24,130,140.18	9,575,624.32	14,554,515.86	15,229,992.24	(675,476.38)
1939	23,609,413.82	106,929.55	681,272.48	24,487,615.85	10,145,272.18	14,342,343.67	15,250,404.68	(908,061.01)
1940	21,177,243.04	118,480.75	1,033,886.06	22,329,609.85	10,041,950.30	12,287,659.55	15,243,237.66	(2,955,578.11)
1941	18,190,379.36	275,775.08	1,008,741.70	19,474,896.14	9,614,117.60	9,860,778.54	15,275,108.42	(5,414,329.88)
1942	9,772,112.42	4,219,425.29	734,465.84	10,726,003.55	9,406,901.79	1,319,101.76	15,301,998.50	(13,982,896.74)
1943	7,308,680.74	3,541,943.70	1,402,542.69	8,916,167.11	11,268,561.39	(2,352,397.28)	15,432,230.92	(17,784,618.17)
1944	5,473,846.30	239,393.31	1,533,294.69	7,246,533.67	12,631,161.42	(5,385,627.75)	15,483,605.43	(20,851,206.18)
1945	7,222,656.14	238,715.40	1,469,183.52	8,930,555.06	13,964,470.81	(4,974,915.75)	15,473,339.95	(20,340,455.70)
1946	14,791,807.14	297,684.60	6,207,608.91	21,297,100.65	6,15,267,100.65	6,15,267,100.65	15,427,340.86	(15,374,370.37)
1947	17,642,146.24	109,811.83	7,172,279.44	19,478,237.51	18,073,909.26	1,404,328.25	15,477,771.31	(14,073,443.09)
Total	554,803,626.54	6,933,975.26	25,398,113.25	587,135,715.05	315,955,764.14	271,179,950.91	409,535,928.32	(138,355,977.41)

¹ After deduction of Canal earnings repaid to appropriations.² Interest prior to July 12, 1920, is included in capital investment account.³ Parentheses denote deficits.⁴ Includes adjustment of \$15,027.41 in postal surplus.⁵ Actual business profits of \$78,835.29 have been adjusted by \$669,226.38 for write-off of reimbursable capital expenditures, public works, Republic of Panama.⁶ Consists of fiscal year 1947 business profits of \$1,142,341.02 and an additional amount for prior fiscal years of \$583,338.42, as detailed in table No. 26.

The foregoing table summarizes by classes the revenues received by The Panama Canal by fiscal years from 1921 and shows the net results from operations after deducting therefrom the net current expenses chargeable to appropriations and the current interest charge on the capital investment. The interest rate of 3 percent has been used in making computations a great many years. The use of this rate received the approval of two organizations which investigated Panama Canal matters and was formally adopted when the present accounting system was established in 1932. It has been considered a fair and reasonable rate, as the Government at various times has paid much higher rates for the use of money.

Interest chargeable to operations is not included on the balance sheet and no interest charge against the Canal is actually made by the United States Treasury.

Total revenues on the foregoing statement represent receipts which must be covered into the United States Treasury and relinquished from control of The Panama Canal. Earnings repayable to Canal appropriations, and reexpendable by the Canal, are deducted from gross operating expenditures, in order to present a comparison of funds covered into the Treasury with funds chargeable to operating account, exclusive of capital additions.

The absence of tax charges is compensated for by the inclusion in Canal operating accounts of the direct costs of civil government, health, and welfare activities. Neither capital nor operating expenses of The Panama Canal include the cost of the military and naval establishments on the Isthmus; however, all important exchanges of services with those interests are covered by cash settlements, or reciprocal allowances.

By including in the accounts all revenues properly applicable to Canal activities and by charging against the total revenue the net appropriation expenses including charges for depreciation and interest at 3 percent on the capital invested but excluding any charge to amortize the investment, there has accumulated as of June 30, 1947, as shown by the above table, a deficit of \$138,355,677.41.

TABLE No. 22.—*Capital refundments*

Balance June 30, 1946.....	\$303,158,575.28
Cash covered into U. S. Treasury.....	18,600,664.16
Business profits (table No. 8).....	\$856,152.11
Revenue due U. S. Treasury (table No. 9).....	17,744,512.05
Total.....	321,750,239.44
Appropriations, fiscal year 1947 (detail below).....	\$18,802,000.00
Less: Net capital additions, current year (table No. 14).....	6,476,494.75
Net appropriation for operating account and incomplete construction.....	12,325,505.25
Net capital refundments, June 30, 1947.....	309,433,734.19

SCHEDULE OF OPERATING APPROPRIATIONS¹

Fiscal year	Maintenance and operation	Sanitation	Civil government	Construction, additional facilities	Miscellaneous	Annual payment to Panama	Total
1914 to 1928.....	\$83,826,211.00	\$9,379,482.00	\$11,160,470.00	-----	\$151,344.55	\$2,000,000.00	\$106,517,507.55
1929.....	6,832,000.00	722,000.00	1,172,400.00	-----	-----	250,000.00	8,976,400.00
1930.....	8,000,000.00	820,000.00	1,201,000.00	-----	-----	250,000.00	10,271,000.00
1931.....	10,162,470.00	753,900.00	1,295,190.00	-----	-----	250,000.00	12,461,560.00
1932.....	9,359,808.00	782,189.00	1,351,689.00	-----	-----	250,000.00	11,743,686.00
1933.....	11,891,011.00	755,650.00	1,300,000.00	-----	-----	250,000.00	14,196,661.00
1934.....	11,172,700.00	698,426.00	1,235,278.00	-----	\$1,150,000.00	430,000.00	14,686,404.00
1935.....	4,971,490.00	738,501.00	792,935.00	-----	-----	430,000.00	6,962,926.00
1936.....	6,900,000.00	874,616.00	1,022,981.00	-----	-----	430,000.00	9,227,597.00
1937.....	9,149,201.00	899,793.00	1,073,950.00	-----	-----	430,000.00	11,552,944.00
1938.....	8,519,000.00	918,000.00	1,131,760.00	-----	\$5,000.00	430,000.00	11,003,760.00
1939.....	8,149,000.00	933,800.00	1,167,325.00	-----	\$153,000.00	430,000.00	10,835,125.00
1940.....	22,823,087.00	1,094,535.00	1,180,802.00	-----	\$36,307.87	430,000.00	23,474,731.87
1941.....	38,282,667.00	1,045,393.00	1,132,011.00	\$15,000,000.00	\$325,000.00	430,000.00	56,285,071.00
1942.....	29,395,286.00	1,635,223.00	1,295,017.00	34,932,000.00	-----	430,000.00	67,887,526.00
1943.....	40,152,437.00	1,692,800.00	1,609,373.00	56,826,800.00	\$277,000.00	430,000.00	100,988,416.00

1944.....	6,016,000.00	1,814,000.00	1,228,100.00	9 (30,257,572.00)	430,000.00	(20,809,472.00)
1945.....	3,850,000.00	1,854,000.00	1,476,400.00	1,476,400.00	430,000.00	9,610,400.00
1946.....	¹⁰ (276,000.00)	2,261,200.00	1,756,000.00	1,756,000.00	430,000.00	7,575,308.26
1947.....	12,749,000.00	2,860,000.00	2,763,000.00	¹¹ 3,428,600.00	430,000.00	18,802,000.00
Total.....	334,135,368.00	32,473,508.00	36,405,681.00	79,929,828.00	9,270,000.00	494,249,545.68
Less: Net capital additions, 1922 to 1947 (table No. 14).....						207,795,600.12
Net appropriation for Canal maintenance and operation and incomplete construction.....						286,453,945.56

¹ Operating appropriations include authorization for capital construction.

² Appropriations for increase in compensation.

³ Covers payments to Panama 1921 to 1928. Payments from 1913 to 1920 charged to cost of construction, \$2,000,000.

⁴ NRA \$1,000,000; Repatriation of Unemployed Aliens, \$150,000.

⁵ Appropriation for Memorial to Maj. Gen. George W. Goethals.

⁶ Navy appropriation for frequency changer, Balboa.

⁷ Appropriation for construction of Trans-Isthmian Highway.

⁸ Transfer from Public Works Administration, FWA, for recreation facilities; \$64,491.74 refunded.

⁹ Refunded to the U. S. Treasury in accordance with proviso "That \$30,257,572 of the appropriation 'Construction, Additional Facilities, Panama Canal' is hereby repealed" (1945 Appropriation Act, Public Law 352, approved June 26, 1944).

¹⁰ Appropriation for 1946 of \$1,724,000 less \$5,000,000 refunded to the U. S. Treasury in accordance with First Supplemental Surplus Appropriation Rescission Act, 1946, Public Law 301, approved Feb. 18, 1946.

¹¹ Includes \$2,618,000 in 1947 Appropriation Act made available in fiscal year 1946.

The total deposits covered into the United States Treasury from the beginning of Canal construction, with minor adjustments to reconcile changes in accounting process, amount to \$595,887,679.75, and deducting therefrom net appropriations for operation and incomplete construction amounting to \$286,453,945.56, as shown above, produces the net capital refundment balance of \$309,433,734.19. Deposits covered into the Treasury consist principally of the earned revenues cited in table No. 21, which total \$587,135,715.05, the balance being made up of sales of property, principally during the construction period, and return of appropriation balances.

Although above table shows a net cash refundment of \$309,433,734.19, such refundment is not deductible from net capital investment as shown in table No. 14, which is considered as measuring the value of The Panama Canal as an instrument of public utility upon which a perpetual return should be earned; furthermore, annual interest on net asset valuation chargeable to operating account is not included in cash transactions with the United States Treasury. Such interest at 3 percent from 1921 to 1947, would have amounted to \$409,535,628.32, as shown in table No. 21, and would have extinguished all capital refundments to date, if such interest charges had been assessed against Canal revenues.

TABLE NO. 23.—*Balance of revenues and refundments*

DEBITS	
Revenue due U. S. Treasury (table No. 9)-----	¹ \$291, 251. 57
Appropriated cash in U. S. Treasury (table No. 8)-----	9, 549, 165. 03
Appropriated cash with fiscal officers (table No. 8)-----	5, 863, 691. 71
Accounts receivable (table No. 10)-----	2, 010, 630. 76
Stores (table No. 11)-----	11, 185, 145. 61
Work in progress (table No. 12)-----	531, 466. 55
Deferred charges (table No. 13)-----	2, 013, 027. 25
Total debits-----	<u>31, 444, 378. 48</u>
CREDITS	
Accounts payable (table No. 15)-----	3, 320, 412. 60
Reserve for repairs (table No. 17)-----	564, 999. 99
Reserve for leave (table No. 18)-----	984, 235. 70
Deferred credits (table No. 19)-----	4, 078, 916. 28
Total credits-----	<u>8, 948, 564. 57</u>
Net current accounts-----	22, 495, 813. 91
Less proportion under capital investment (table No. 14)-----	<u>7, 010, 855. 00</u>
Balance-----	15, 484, 958. 91

¹ Includes \$16,224.40 of bills in process of collection.

A revolving fund now fixed at \$7,010,855 is set up in Canal accounting for working capital and is credited to capital investment account in addition to funds used for construction and equipment, the total constituting the base for capital interest computations. Net working capital in excess of the revolving fund represents unexpended balances

of appropriated funds to cover unaccomplished construction; funds for replacement of plant and equipment, and business profits for the fiscal year 1947 to be covered into the United States Treasury.

TABLE NO. 24.—*Canal revenues*

	Fiscal year 1947	Fiscal year 1946
Tolls.....	\$17,642,146.24	\$14,791,807.14
Postal surplus.....	(100,464.44)	82,254.16
Licenses, fees, fines, etc.....	209,153.23	177,384.27
Miscellaneous.....	1,123.04	8,046.17
Total.....	17,751,958.07	15,059,491.74

NOTE.—Parentheses denote deficit.

Canal revenues shown above, with the exception of net postal receipts which are carried forward from year to year, comprise earnings which by law must be covered into the United States Treasury as miscellaneous receipts, United States revenues, as distinguished from earnings repayable to Canal appropriations shown on tables Nos. 25 and 26.

Expenses of the Canal Zone postal operations exceeded revenues by \$100,464.44, as indicated above. This loss is fully covered by, and absorbed by the accrued surplus.

TABLE NO. 25.—*Canal earnings and expenses*

	Expenses	Earnings	Net expenses
Maintenance and operation:			
Management:			
Office of Governor.....	\$38,377.91	\$10,380.00	\$27,997.91
Office of engineer of maintenance.....	69,980.56	14,400.00	55,580.56
Office of comptroller and budget officer.....	47,214.38	15,334.57	31,879.81
Total.....	155,572.85	40,114.57	115,458.28
Canal operation and maintenance:			
Office of assistant engineer of maintenance.....	15,457.02		15,457.02
Locks operation and maintenance.....	2,650,388.86		2,650,388.86
Locks quadrennial overhaul.....	961,705.72		961,705.72
Office engineering division.....	669,809.79	554,179.60	115,630.19
Section of meteorology and hydrography.....	81,019.55	31,699.55	49,320.00
Marine division.....	3,148,590.97	1,722,699.91	1,425,891.06
Dredging division.....	4,849,830.42	2,107,039.77	2,742,790.65
Dams, reservoirs, and spillways.....	89,226.93		89,226.93
Depreciation on Canal general property.....	1,500,000.00		1,500,000.00
Annual payment to Republic of Panama.....	430,000.00		430,000.00
Total.....	14,396,029.26	4,415,618.83	9,980,410.43
Utilities and services:			
Public buildings and grounds.....	791,765.44	517,652.39	274,113.05
Highways.....	578,770.65	1,554.23	577,216.42
Sewers.....	44,822.99		44,822.99
Air terminal.....	109,190.22	105,052.93	4,137.29
Personnel administration.....	955,511.50	445,102.96	510,408.54
General correspondence and records.....	261,747.35	98,214.02	163,533.33
Office of general counsel.....	28,405.87	13,032.00	15,373.87
Offices of paymaster and collector.....	181,306.28	114,115.00	67,191.28
Accounting department.....	1,019,619.89	712,587.57	307,032.32
Offices in the United States.....	691,905.89	324,905.89	367,000.00
Total.....	4,663,046.08	2,332,216.99	2,330,829.09
Total, maintenance and operation.....	19,214,648.19	6,787,950.39	12,426,697.80

TABLE No. 25.—*Canal earnings and expenses*—Continued

	Expenses	Earnings	Net expenses
Sanitation:			
Chief health office	76, 115. 79	391. 24	75, 724. 55
Hospitals	3, 357, 753. 73	1, 292, 714. 17	2, 065, 039. 56
Dental clinics	75, 642. 48	83, 371. 80	(7, 729. 38)
Venereal disease clinics	181, 270. 29		181, 270. 29
Dispensaries	322, 317. 25	187, 591. 99	134, 725. 26
Cemeteries	84, 401. 01	53, 518. 60	30, 882. 41
Quarantine and immigration	182, 069. 58	93, 071. 31	88, 998. 27
Sanitation	958, 299. 98	668, 492. 03	289, 807. 95
Total, sanitation	5, 237, 870. 11	2, 379, 151. 20	2, 858, 718. 91
Civil government:			
Office of executive secretary	34, 433. 27		34, 433. 27
Civil affairs division	286, 409. 01	4, 848. 12	281, 560. 89
License bureau	24, 209. 00		24, 209. 00
Schools	1, 073, 747. 84	100, 474. 67	973, 273. 17
Library	45, 700. 41	6, 546. 64	39, 153. 77
Physical education and recreation	173, 260. 88	17, 460. 11	155, 800. 77
Police section	1, 195, 224. 69	287, 813. 38	907, 411. 31
Fire section	375, 110. 73	46, 328. 47	328, 782. 26
Courts	43, 868. 11		43, 868. 11
Total, civil government	3, 251, 963. 94	463, 471. 39	2, 788, 492. 55
Postal service	840, 360. 21	739, 895. 77	100, 464. 44
Transferred from postal surplus		100, 464. 44	(100, 464. 44)
Total, postal service	840, 360. 21	840, 360. 21	
Net Canal expenses	28, 544, 842. 45	10, 470, 933. 19	18, 073, 909. 26

SUMMARY

Canal revenues (table No. 24)			\$17, 751, 958. 07
Net Canal expenses			18, 073, 909. 26
Net Canal deficit (table No. 20)			(321, 951. 19)

NOTE.—Parentheses denote deficit.

The earnings of the divisions engaged in the transiting of vessels through the Canal, as well as earnings of sanitation and civil government divisions, are deducted from gross expenses to arrive at the net expenditure from Canal appropriations, which in turn are deducted from Canal revenues to arrive at net Canal deficit, exclusive of business division profits.

Earnings of the executive offices and accounting department represent principally a proportional charge against business divisions of The Panama Canal and the Panama Railroad Co. Business divisions are reimbursed for this proportional expense by adding a percentage of overhead to the direct cost on all work performed. The Panama Railroad's proportion is distributed to the various units of that organization.

The earnings of the offices in the United States comprise charges against storehouse operations to cover a proportional part of the cost of purchasing, inspection, and handling of material used by divisions and the Panama Railroad Co. or sold to outside interests, which expense is recovered by adding a fixed percentage to the price of material.

TABLE No. 26.—*Business expenses, revenues, and profit or loss*

	Expenses	Revenues	Profit or loss
Electric power system.....	\$1, 223, 203. 94	\$1, 549, 657. 27	\$326, 453. 33
Electrical work.....	1, 705, 888. 33	1, 718, 680. 78	42, 792. 45
Water system.....	878, 603. 21	1, 048, 069. 84	169, 466. 63
Municipal work.....	3, 132, 256. 15	3, 192, 201. 61	59, 945. 46
Sosa Hill rock crusher and batching plant.....	420, 582. 23	459, 191. 92	32, 609. 69
Mechanical division.....	5, 814, 674. 63	5, 989, 627. 24	174, 952. 61
Wharves and piers.....	41, 669. 28	90, 000. 00	48, 390. 72
Oil-handling plants.....	2, 063, 243. 64	2, 140, 792. 57	77, 548. 93
General storehouses.....	9, 486, 152. 34	9, 585, 596. 52	99, 444. 18
Motor transportation division.....	2, 043, 116. 10	2, 024, 033. 01	(19, 083. 09)
Building division.....	4, 531, 866. 15	4, 560, 072. 63	28, 206. 48
Panama Canal press.....	459, 393. 32	481, 833. 02	22, 439. 70
Gold quarters.....	1, 492, 632. 78	1, 484, 986. 11	(7, 646. 67)
Silver quarters.....	452, 103. 24	467, 613. 87	15, 510. 63
Subsistence section.....	222, 543. 91	222, 543. 91	-----
Gasoline service stations.....	452, 972. 30	472, 300. 17	19, 327. 87
Sand and gravel operations.....	53, 986. 36	57, 968. 46	3, 982. 10
Rental, Hotel Tivoli.....	-----	48, 000. 00	48, 000. 00
Total.....	34, 480, 827. 91	35, 623, 168. 93	1, 142, 341. 02
Add: Additional amounts for prior fiscal years:			
Motor transportation division: Net inventory overage.....	-----	-----	42, 608. 78
General storehouses:	-----	-----	-----
Net scrap revenue.....	-----	-----	272, 449. 48
Proceeds from sale of surplus and obsolete property.....	-----	-----	262, 474. 18
Gasoline service stations: Funds obligated in prior fiscal year for relocation of Gatun service station not now required (project abandoned).....	-----	-----	6, 405. 98
Subtotal, prior fiscal years.....	-----	-----	583, 938. 42
Total business profits to be covered into Treasury.....	-----	-----	1, 726, 279. 44

NOTE.—Parentheses denote loss.

The profit of \$1,142,341.02 for fiscal year 1947 compares with profits in fiscal year 1946 of \$876,835.29. The amount of \$1,726,279.44 to be covered into the Treasury as miscellaneous receipts, United States revenues, includes the amount of \$583,938.42 for prior fiscal years.

The loss in gold quarters operations is due to extraordinary damages by fire in gold quarters structures in the amount of \$34,261.60, which represents the depreciated value of the buildings destroyed.

Public works, Panama and Colon, have been dropped from this table in view of Executive Order 9551 and pursuant to Public Law No. 48, approved May 3, 1943, whereby all right, title, and interest of the United States in and to water and sewerage systems in the cities of Panama and Colon have been transferred to the Republic of Panama, effective January 1, 1946.

Business operations of The Panama Canal are conducted separately from operating activities pertaining directly to the transiting of vessels, and government of the Canal Zone. The annual appropriation acts for The Panama Canal authorize the use of appropriated funds for the conduct of auxiliary business activities, provided that funds so advanced are recovered through earnings, and with the further provision that any net profit derived from such business activities be covered annually into the United States Treasury.

TABLE No. 27.—Balances in appropriations and funds, June 30, 1947

ASSETS						
	U. S. Treasury appropriations	Cash on hand	Accounts receivable	Transfers available	Work in progress and suspense	Storehouse stock
Maintenance and operation, Panama Canal	\$7,453,711.04	\$4,505,619.03	\$1,768,593.26	\$153,424.77	1 \$1,427,825.01	\$10,770,929.88
Sanitation, Canal Zone, Panama Canal	3,377.00	402,801.47	219,488.49	-----	-----	366,987.36
Civil government, Panama Canal and Canal Zone	3,745.28	223,869.09	17,153.95	-----	1,402.73	17,228.37
Postal funds, Canal Zone (special fund)	168,277.15	154,815.17	4,200.71	-----	-----	327,323.03
Repatriation of unemployed aliens, Panama Canal	45,000.00	7,027.86	-----	-----	3,491.42	52,027.86
Memorial to Maj. Gen. George W. Goethals	156,508.58	-----	1,194.35	-----	-----	160,000.00
Construction, additional facilities, Panama Canal	1,718,545.98	530,506.34	-----	-----	-----	2,250,246.67
Working fund, Panama Canal: Hospitalization of military personnel	-----	39,022.75	-----	-----	-----	-----
Transfer from defense public works, FWA: Community facilities	-----	275,027.17	16,224.40	1,726,279.44	212,508.26	-----
Miscellaneous receipts, United States revenues	-----	-----	-----	-----	-----	2,017,531.01
Total	9,549,165.03	6,138,718.88	2,026,855.16	1,879,704.21	1,645,227.42	11,185,145.61
						32,424,816.31
LIABILITIES						
	Working capital allotment	Accounts payable	Transfers payable	Special liabilities	Funded reserves	Appropriation balance
Maintenance and operation, Panama Canal	\$6,520,855.00	\$2,492,703.69	\$1,726,279.44	1 \$2,414,392.15	\$7,584,292.28	\$5,311,580.43
Sanitation, Canal Zone, Panama Canal	480,000.00	381,466.46	64,449.19	91,488.23	-----	2,230.44
Civil government, Panama Canal and Canal Zone	10,000.00	203,634.09	9,209.35	33,556.76	-----	6,969.22
Postal funds, Canal Zone (special fund)	-----	42,159.83	4,671.40	170,773.90	-----	109,717.90
Repatriation of unemployed aliens, Panama Canal	-----	(855.00)	186.83	-----	-----	52,526.03
Memorial to Maj. Gen. George W. Goethals	-----	198,133.53	60,519.50	444,774.61	-----	160,000.00
Construction, additional facilities, Panama Canal	-----	-----	14,358.50	24,664.25	-----	1,546,789.03
Working fund, Panama Canal: Hospitalization of military personnel	-----	-----	-----	-----	-----	-----
Transfer from defense public works, FWA: Community facilities	-----	2,017,531.01	-----	-----	-----	212,508.26
Miscellaneous receipts, United States revenues	7,010,855.00	5,337,943.61	1,879,704.21	3,179,619.90	7,584,292.28	7,432,371.31
Total						32,424,816.31

1 Not including \$869,266.38 for public works, Republic of Panama, held in security deposit account.

This table shows the status of Panama Canal working capital by the various appropriations and funds by which it is separately accountable under existing laws and Treasury regulations.

A revolving fund of \$7,010,855 is set aside in Canal accounting to cover the net investment in current accounts, which sum is included in the capital investment account (table No. 14).

Table No. 28 shows the detail of the funded reserves stated in this table as \$7,584,292.28.

TABLE NO. 28.—*Funded reserves, fiscal year 1947*

	Adjusted balance, July 1, 1946	Accruals	Expendi- tures	Balance, June 30, 1947
Marine division:				
Tugs.....	\$277,831.39	\$40,680.00		\$318,511.39
Launches.....	75,314.79	56,754.54		105,287.09
<i>Quail</i>			\$26,782.24	
Machine barges.....	13,087.43			13,087.43
Launch repair barges.....	4,872.00	1,392.00		6,264.00
Total.....	371,105.61	98,826.54	26,782.24	443,149.91
Dredging division:				
Tugs and crane boats.....	130,086.49	50,180.00		180,266.49
Launches.....	110,629.82	20,438.17		131,067.99
Dredges.....	858,880.00	82,860.00		941,740.00
Dump scows.....	148,499.58	39,120.00		187,619.58
Machine barges.....	65,565.39	52,344.00		117,909.39
Lighters.....	29,958.40	14,592.00		44,550.40
Anchor barges.....	4,290.00	1,560.00		5,850.00
Total.....	1,347,909.68	261,094.17		1,609,003.85
Total, transit divisions.....	1,719,015.29	359,920.71	26,782.24	2,052,153.76
Electric power system:				
Hydroelectric plant, Gatun.....	87,341.95	32,520.00		119,861.95
Diesel electric plant, Miraflores.....	251,522.50	64,044.00		315,566.50
Substations.....	337,781.94	36,109.32		373,891.26
Transmission system.....	56,398.27	23,520.00		79,918.27
Madden Dam system.....	148,629.37	31,260.00		179,889.37
Electric ranges.....	202,605.80	16,416.00		219,021.80
Total.....	1,084,279.83	203,869.32		1,288,149.15
Electrical work:				
Fixed property.....	61,141.76	9,729.36		70,871.12
Equipment.....	7,078.15	264.00		7,342.15
Total.....	68,219.91	9,993.36		78,213.27
Water system:				
Pump station buildings.....	1,624.53	7,332.00		8,956.53
Pump station machinery.....	103,382.71	26,100.00		129,482.71
Filter plant buildings.....	82,507.73	26,640.00		109,147.73
Filter plant machinery.....	101,199.73	15,082.00		116,281.73
Reservoirs and tanks.....	67,545.07	11,676.00		79,221.07
Pipe lines:				
Large mains.....	60,824.98	36,720.00		35,668.19
Relocate line, sec. E, Gorgas Hospi- tal, Ancon.....			20,499.49	
Install 10-inch low-pressure line, Balboa to Amador.....			41,108.74	
Clean and reline 30- and 36-inch main, Gamboa to Miraflores.....			268.56	
Distribution.....	5,819.48	43,092.00		48,143.63
Balboa.....			767.85	
Total.....	422,904.23	166,642.00	62,644.64	526,901.59
Municipal work:				
Fixed property.....	29,238.10	3,282.00		32,520.10
Equipment.....	78,613.55	12,460.72	2,235.69	88,838.58
Total.....	107,851.65	15,742.72	2,235.69	121,358.68

TABLE NO. 28.—*Funded reserves, fiscal year 1947—Continued*

	Adjusted balance, July 1, 1946	Accruals	Expendi- tures	Balance, June 30, 1947
Mechanical Shops:				
Fixed property:				
Balboa shops.....	\$167,515.81	\$17,171.06		\$214,686.87
Balboa railroad shops.....	65,579.08	6,108.92		71,688.00
Cristobal shops.....	122,160.49	11,188.75		133,349.24
Equipment:				
Balboa.....	298,961.82	78,640.22		184,259.19
Install Navy equipment.....			\$176,849.31	
New equipment.....			16,493.54	
Cristobal.....	271,830.76	33,659.17		252,789.20
Install Navy equipment.....			52,700.73	
Total.....	1,926,017.96	176,768.12	246,043.58	856,772.50
Oil-handling plants:				
Balboa:				
Pumping plant.....	52,040.75	4,293.84		21,834.92
400-horsepower boiler.....			34,499.67	
Storage tanks.....	57,470.13	8,881.44		66,351.57
Pipe lines.....	81,885.17	17,037.48		98,922.65
Dock No. 4.....	23,100.00	3,300.00		26,400.00
Cristobal:				
Pumping plant.....	54,505.94	4,317.72		22,546.15
400-horsepower boiler.....			36,277.51	
Storage tanks.....	27,882.63	10,624.68		38,507.31
Pipe lines.....	225,873.81	24,792.00		250,665.81
Total.....	522,758.43	73,247.16	70,777.18	525,228.41
General storehouses:				
Fixed property.....	206,719.69	38,079.75		244,799.44
Equipment.....	33,266.47	7,373.65	1,235.05	39,405.07
Total.....	1,239,986.16	45,453.40	1,235.05	281,201.51
Motor transportation division:				
Transportation:				
Fixed property.....	23,865.80	6,810.00		30,675.80
Motor vehicles.....	230,210.24	134,737.91	136,563.38	228,384.77
Repair shops:				
Fixed property.....	42,545.33	4,951.07		47,496.40
Equipment.....	21,726.91	1,768.42	1,019.00	22,416.33
Total.....	318,348.28	148,207.40	137,582.38	328,973.30
Building division:				
Fixed property.....	16,793.06	1,683.00		18,476.06
Equipment.....	20,735.39	10,167.25	6,840.69	24,061.95
Total.....	37,528.45	11,850.25	6,840.69	42,538.01
Panama Canal press: equipment	31,731.82	6,860.22		38,595.04
Gold quarters:				
Fixed property.....	431,311.02	391,196.77		64,429.52
Alterations and improvements.....			53,217.00	
Preliminary plans and studies.....			18,799.33	
New construction.....			686,061.91	
Total.....	431,311.02	391,196.77	758,078.27	64,429.52
Silver quarters:				
Fixed property.....	7,711.99			4,711.99
New construction.....			3,000.00	
Total.....	7,711.99		3,000.00	4,711.99
Gasoline service stations:				
Fixed property.....	24,425.70	1,641.49		26,067.19
Clubhouse business structures:				
Fixed property.....	32,602.55	14,157.12		46,759.67
Total, business divisions.....	4,255,710.98	1,265,629.33	1,288,437.48	4,232,902.83
Total, reserve for replacements.....	5,974,726.27	1,625,550.04	1,315,219.72	6,285,056.59
Total, reserve for repairs (table No. 17).....	215,327.90	551,474.58	234,802.49	564,999.99
Total, reserve for leave ¹ (table No. 18).....	1,163,472.02	1,158,160.10	1,587,396.42	734,235.70
Total, funded reserves (table No. 27).....	7,353,526.19	3,338,184.72	3,137,418.63	7,584,292.28

¹ Adjusted balance after transfer of \$419.03 from Mechanical Division to General Storehouses due to transfer of miscellaneous equipment.

² Less \$250,000 transferred to replacement funds

UNIVERSITY OF FLORIDA



3 1262 08300 711 1

SCI-HSSL

